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REPORT ON THE CULTIVATION OF COFFEE IN MEXICO.

(By Mr F. Stronge, Secretary of Legation.)

INTRODUCTORY.—The cultivation of coffee in Mexico dates from the commencement of the present century, and it has long been known that many districts in various parts of the country are probably as well suited to the growth of the plant as any in the world. The unsettled state of the Republic, however, retarded progress in this as in many other respects, and it is only of late years that the capabilities of the country as a coffee producer have attracted the attention which they undoubtedly deserve.

The almost total failure of the coffee plantations in Ceylon and all Eastern countries, and the recent bad coffee harvests in Brazil, together with the fall in silver and the consequent reduction in the price of land and labour in this country have encouraged planting in Mexico, and the profits which have already been obtained seem to justify a further extension of the industry. Under these circumstances, and in view of the fact that before long a considerable amount of British and American capital will probably be invested in coffee plantations in Mexico, some information on the subject which has been obtained from good sources may perhaps prove of interest.

A considerable area in various States in Mexico is suited to the growth of coffee, but as many conditions are required to ensure its profitable cultivation, great care should be taken in selecting the site of the proposed plantation.

PRE-REQUISITES FOR SUCCESS.— The following are the principal points to which attention should be paid:—1. Soil; 2. Climate; 3. Communications; 4. Labour.

1. *Soil.*— The coffee plant can be cultivated on various descriptions of soil, but it thrives best on light, porous loam of considerable depth, which has not before been brought under cultivation. Clay land should generally be avoided as unsuitable.

In Mexico the best land is generally covered with virgin forest, and clearing it is the first operation the planter has to undertake. A rolling surface is to be preferred as it affords greater facilities for drainage, but very steep slopes are not as a rule to be recommended.

2. *Climate.*—The best temperature is one varying between 65° and 85° Fahr., which can be obtained in nearly all of the States in the Mexican Tierra Caliente. Frost kills the plant, and the fierce rays of the tropical sun if untempered by abundant moisture are almost equally injurious. Most authorities on the subject agree that coffee thrives best where the rainfall is at least 100 inches per annum, and where it is pretty evenly distributed throughout the year. It should be noted, however, that coffee has been and is cultivated with some success in districts (such as Cordova, in the State of Vera Cruz) where the rainfall is far less. Immunity, or at least protection, from high winds is very desirable. An eastern exposure is to be preferred where the weather is generally cloudy, and a western in a sunny climate. Some writers attach great importance to the height of the plantation above the sea, and assign limits of altitude for the choice of a site. It has, however, been shown by experience that suitable climatic conditions are to be found at a wide range of elevation, and that coffee of the highest quality can be grown almost at the sea level.* In selecting a site for a plantation too much attention cannot be paid to soil and climate, and it has always been found to be good policy to give even a comparatively high price for land where these were thoroughly satisfactory.

3. Facilities of communication are also of great importance. Railways have been much developed of late years, and their extension is being carried on rapidly. Still, some districts which would otherwise be very suitable for coffee planting will probably for some time to come be too inaccessible to be recommended.

* Notably in Liberia

As freight is generally cheaper by water than by land, a navigable river in the neighbourhood of the plantation is to be preferred even to a railway. In many parts of the country roads can scarcely be said to exist, and the necessity for railway or water communication to within a moderate distance of the plantation is even greater than it would be in more advanced countries. It must also be borne in mind that the cultivation of coffee is almost always combined with that of other crops, some of which are very bulky and cannot easily be disposed of without facilities of transport.

4. It is very desirable to settle in a district where labour is easily obtained, and although some authorities maintain that imported labourers are more easily controlled, the expense of introducing them is considerable, and many practical difficulties have to be overcome.

WAGES.—The wages paid vary in different districts, but the average rate for the whole country was officially estimated in 1892 at 37c. Mexican currency (or 9½*d.*) per diem. Since that date prices have certainly risen' and the daily wage is now generally placed at about 50c. (1*s.* 1*d.*). Both employers and employed frequently prefer piecework to a daily wage, particularly for such work as clearing land before planting the coffee.

LABOUR.—The Mexican labourer requires careful handling if the most is to be made of him. A rich soil and a tropical climate supply nearly all his requirements, with little effort on his part, and he will not easily submit to harsh or unfair treatment from his employer.

Many planters find it advantageous to give their labourers small allotments, which they can cultivate themselves, in addition to their wages. They maintain that the labourers themselves appreciate this system, and that where it is in force they become more disposed to remain working on the same estate.

In some districts the Labour Question is the planter's chief difficulty. The coffee plants must be kept clean, and the berries must be picked at the proper time. These operations cannot be postponed, and it is useless to undertake coffee cultivation without a sufficient supply of hands.

THE PLANTATION.—As the best coffee lands are almost invariably covered with forest or jungle, the planter's first task is to clear this away. The brushwood is cut out with the "machete," a species of cutlass; and the heavy timber is afterwards felled with an axe. Such timber as can be used on the estate or can be disposed of is then removed, and the remainder is afterwards fired. On most plantations in Mexico it is usual to preserve the large trees for shade; but in districts where the best climatic conditions exist this is unnecessary. Much shade is in itself detrimental to the fullgrown coffee plant, and localities where it is required owing to great sun heat and lack of proper moisture should be avoided.*

NURSERIES.*—When the clearing of the land is commenced, a suitable spot is selected for sowing the coffee-bean, in order to establish a nursery, to be made use of in the following year. Trees required for the first planting are generally purchased from existing coffee plantations. The spot selected for the nursery should be thoroughly cleared of trees, should be easily irrigated, and of average fertility. In Mexico it is usual to leave some of the trees as shade, but in other places it has been found that the drip is injurious to the young plants, and that it is far better to arrange a shade of cut brushwood. Long ridges are formed with a width of from 4 to 6 feet, with walks between, in order that the workmen may later on reach the plants when it is necessary to clean them. In forming the ridges the earth should be well broken with hoes to a depth of at least 6 inches, the stones picked out, and the surface smoothed down. The ground is then ready for the coffeebean. The beans are dispulped and allowed to foment, so as to admit of the saccharine matter being washed off. When this is done the beans that float on the top of the water are taken away as being unsuitable, and those which sink to the bottom are placed to dry for one day in the sun, and for two additional days in the shade. They are then ready to be sown.

The sowers make small furrows in the earth with a pointed staff across the ridges, at a distance of 5 inches apart, and 2½ inches deep. Another labourer follows, placing the coffee-beans in the furrows 4 inches apart, until the ridge is finished. The beans are then lightly covered with well-sifted earth, without been pressed down, and are afterwards watered with a sprinkler. Subsequently the ground is watered every two or three days, and in from forty to sixty days the plant begins to grow. Care must afterwards be taken to keep the ridges free from weeds, and in about eight months the plant is ready for transplanting.

Slightly different methods are sometimes adopted, and sometimes the young plants found growing underneath the coffee trees are planted direct in the plantations, but this system is no longer considered a good one, and has been generally abandoned.

The time for sowing varies in different States, and in some of them sowing is carried on at all times of the year. It is desirable, however, to time the sowing of the seed in the nurseries in such a way that the plants may be from 8 to 9 inches high in the planting season. It may be noted that in Mexico the plants are often kept much longer in the nurseries, but this plan has not been found to answer in other countries, where the scientific study of coffee cultivation is much more general than is the case here.

In transplanting the trees to their final destination, the labourers should be given a base line, from which a rope should be stretched at right-angles, with marks at the required distances, say 6 feet apart. An acre of ground holds about 950 trees, planted 6 feet apart, with 7 feet between the rows. This opening is very generally adopted, though some planters in this country prefer to plant at greater distances. Special care should be taken in planting the trees that the tap root is not twisted or bent. Nipping off the tender portion, if done in the right way, does not materially affect the growth of the tree, and obviates the danger of its being turned up, which in a year or two kills the plant. The other precautions to be taken in planting do not require special mention, as they are such as would commend themselves to anyone having even a slight knowledge of arboriculture. The best time for planting is the early part of the rainy season.

* Although there can be little doubt that where the climate is most suited to the growth of the coffee plant shade is unnecessary and even injurious, the practice of having most of the larger trees of the natural forest as shade for the coffee trees is so general in Mexico that it cannot be passed by without fuller notice. Many persons possessing considerable experience of coffee planting in Mexico will even be found to maintain that shade is absolutely essential, and it is quite possible that in the districts with which they are best acquainted such may be the case. On the other hand, in countries where coffee has been extensively cultivated for a longer time than in Mexico, the plant certainly succeeds better without shade. Further experiment is perhaps required before a definite conclusion can be arrived at as regards this country, but it will scarcely be denied by the most enthusiastic supporter of the Mexican system that the tendency has been to make the shade too thick. The truth seems to be that coffee can be cultivated profitably in districts which are not naturally suited for it, and that in some of these shade is really necessary to protect the plant from the excessive heat of the sun. Owners of land in comparatively hot and dry districts may find it necessary to shade their plants with forest trees or, in extreme cases, even with bananas, but such localities should be avoided by persons who have a free hand in the selection of a site for their plantation.

* The following description is mainly taken from a work by Mr. Taylor.

IRRIGATION AND MANURING.—Irrigation and also manuring are sometimes resorted to in Mexico, but if a suitable site has been selected, neither will be necessary on a new plantatiou. It may be added that the practice of manuring the nursery ground is not a good one, as it unfits the young plants for their ultimate destiuatiou.

CLEANING.—It is very necessary that the young trees should be kept clear of weeds, a matter to which in Mexico insufficient attention is generally paid. Weeding should be carried out every month, and though it is an expensive operation, the cost of the labour will be amply rapid by the yield of coffee. Hand weeding is to be preferred as being both cheaper and more effectual.

TOPPING AND PRUNING.—In Mexico, where empiric methods have hitherto largely prevailed, there is some divergence of opiuion on this subject. In other coffee-growing couutries, however, no doubt is entertained that the plant should be topped at from 3 to 5 feet from the ground, the object being to confine the sap, so that not only primary branches but secondaries and tertiaries may also bear their crop from 9 inches from the ground upwards. Ou rich soils the trees may be allowed to grow taller than on poor lands. Topping should be done with a knife, and only on the matured wood, otherwise the wound will bleed and the tree will be ruined. The trees are generally prυued between the second and third year, after the crop has been gathered. The operation is repeated iu subsequent years, and the plant is kept as far as possible in the shape of a low symmetrical bush, without straggling or unproductive brauches. On badly mauaged plantations, and particularly where the shade is too thick, the plants become drawn up, poorly furnished, and comparatively uuproductive.

HARVESTING.—The coffee berry ripeus at different seasons in different places, but in most localities the principal picking takes place in the late autumn, and in the winter. The berries are picked off as soou as they become bright red iu colour, and either the same evening or the following day the pulp is removed by means of a machine called a pupler.*

The berries fall from the machine into a receptacle of stone or wood, in which they remain from 12 to 24 hours. They are then passed into a lower receptacle, iuto which water is poured, and are stamped or trampled upon until the sticky glutinous substance disappears. The beaus which float on the top, being of inferior quality, are collected and dried separately, aud the remainder are spread out in the yards or on mats to dry. This requires 4 or 5 days' exposure to the sun. The parchment-like skin is loosened by rubbing the berries between the palms of the hands. The coffee when dried is stored in granaries, and afterwardes beaten, winnowed, sorted, and packed for export. All these operations, though somewhat complicated to describe, are really of a very simple character, and the whole art of treatiug the coffee after it is gathered, though requiriug some care and attention, may be acquired with very slight experience. Machinery, which is comparatively inexpensive, is gradually taking the place of hand labour, and is, no doubt, more economical, particularly on large plantations, but the older methods are still very generally employed. It has been estimated that a complete set of machinery for a large plantation would cost from 600*l.* to 1,100*l.* On small plantatious, however, a hand pulper costing some 12*l.*, or rather more, will probably be found sufficient machinery with which to commence operations, more being added as occasiou requires.

AMOUNT OF CAPITAL REQUIRED AND PRICE OF LAND.—The intending planter will find a capital of 1,500*l.* amply sufficient for his requirements. It is far better to begiu planting on a comparatively small scale, and to gain thorough experieuce of the country and the business before embarking on an unnecessarily large undertaking. Some 250 acres is as much as a beginner should attempt to deal with, and even of this only 200 acres should be planted with coffee, the remaining 50 acres being left under timber, or applied to other purposes.

Good lands for planting can be obtained at from 18*s.* to 1*l.* 10*s.* per acre, and sometimes even cheaper. If theu we take the mean between these two prices, 250 acres would cost 300*l.*, and the planter with 1,500*l.* capital would still have 1,200*l.* in hand with which to meet initial expenses and to maintain himself until his plantatiou came iuto full bearing. At first sight this sum will appear uuuecessarily large, but in a country where credit is not easily obtained, and where the interest ou borrowed mouey is very high, it is well to hold a reserve of capital as an insurance against unforeseeu accidents. The failure of a large number of foreigners in this country may be attributed to neglect of this precautiou.

COST AND PROFIT.—This is a subject ou which there exists an extraordiuary diversity of opinion, and many estimates, though quite honestly put forward, are, in fact, far too favourable. Calculations based (as is frequently the case) ou the ascertained produce of a single plaut are especially misleading, for, however favourable the conditions may be, the differeut plauts vary both in the quantity and quality of their yield, and some are altogether unproductive. Perhaps the best plan is to take the average cost of cultivating an acre, aud then to give an estimate of the value of the crop for the first 5 years. The following figure will be found to be pretty near the mark, but if anythiug they show a smaller return than may be expected if all the conditions are favourable :—

COST OF CULTIVATION PER ACRE DURING FIRST FIVE YEARS.

	Amount. £	s.	d.
Clearing land	1	4	0
Staking and digging holes for 1,000 trees	0	14	0
Purchase of 1,000 young coffee trees ..	0	10	0
Planting 1,000 trees	0	6	0
Replacing loss of coffee trees ..	0	3	0
Mouthly cleaning for five years ..	6	0	0
Cost of harvesting 2,600 lb. of coffee including freight, taxes, &c., at 8 Mexican cents per lb... ..	21	10	8
Total ..	30	7	8

PRODUCE AND RECEIPTS PER ACRE.

	Amount. £	s.	d.
First year		Nil.	
Second year, 200 lb., sold at 21 Mexican cents	4	11	0
Third year, 400 lb.	9	2	0
Fourth year, 800 lb.	18	4	0
Fifth year, 1,200 lb.	27	6	0
Total ..	59	3	0

In making these calculations it has been assumed that a good site has beeu chosen, aud that the land and its produce have been properly treated. Ou the other hand, the price obtained for the bean—a matter which is uot entirely iu the plauter's control—has been estimated at a low figure. It may be mentioned, however, that scieutific cultivation of the plant and careful treatment of the bean after picking will ofteu raise the value of the produce by improving its quality as much as 25 per cent.

The cost of making the nursery and the necessary roads or tracks has not been included in the above estimate, but these expenses are not heavy, and appear altogether iuconsiderable when calculated per acre. Moreover, as this work is of a permanent character, it may fairly be charged to capital account. The same may be said of buildings, tools, &c., the cost of which has been estimated as low as 50*l.* for a moderate-sized plantation. It seems unlikely,

* Small native cultivators do not, as a rule, use a pulper. They first dry the berry and then tread out the grain from the dry husks with the feet.

however, that anyone accustomed to live either in Europe or the United States would be satisfied with so low a standard of comfort as is implied by these figures. The cost of the house must, of course, largely depend on the habits and inclinations of the planter, but if he be a person of moderate requirements some 100*l.* to 200*l.* should cover his expenditure on this head.

In treating of the expense of starting a plantation it should be mentioned that the cultivation of other crops is frequently combined with that of coffee. For instance, maize may be advantageously planted between the rows of coffee plants on newly cleared land. The shade is most beneficial to the trees at this stage of their growth, and the profit on the crop may be reckoned at about 25 per cent. on the cost of clearing the land.

In its fifth year of growth the coffee plant attains its full power of production, and the estimated yield for that year may be accounted the normal crop. By that time, too, the initial expenses in connection with that part of the plantation will naturally have ceased. The account for the sixth year should, therefore, stand approximately as follows:—

EXPENSES PER ACRE IN SIXTH AND SUBSEQUENT YEARS.

	Amount. £	s.	d.
Clearing or weeding	1	4	0
Pruning, &c.	0	5	0
Harvesting, &c., 1,200 lb. coffee ..	10	8	0
Total ..	11	17	0

RECEIPTS PER ACRE IN SIXTH AND SUBSEQUENT YEARS.

	Amount. £.	s.	d.
1,200 lb. coffee at 21 Mexican cents	27	6	0

It will be seen that these figures would admit of liberal allowances for interest on capital and for personal expenditure, and would still leave a substantial balance in the planter's favour.

General Remarks.—In purchasing an estate in Mexico, a new comer should as a rule have recourse to a reliable foreign agency. Direct negotiations with the owners of the soil are often extremely tedious, and they should not be undertaken by any one who does not possess a thorough knowledge of the country. Care must of course be taken to obtain a good title to the land purchased, and in most case this can now be done without m ch difficulty or expense. In some districts the Indian villagers lay claim to certain rights over adjoining lands, and however unfounded such claims may be, they are sometimes a source of great irritation and consequent annoyance to the foreign planter. It will almost always be found, however, that these difficulties may be overcome by a little tact and liberality.

A foreigner buying real estate should, if he desire to preserve his nationality, take the proper legal steps to do so.

The intending planter will generally do well to spend some little time in the country before making a purchase, and should if possible acquire some practical knowledge of his business at an existing plantation. He will be apt to think that by waiting he is letting slip many a golden opportunity, but such opportunities will probably recur later, and the experience he will have gained will save him much loss and disappointment. A considerable number of small foreign capitalists in this country would probably admit that for a year or two after their arrival, experience was their only profit, and that it had been gained at a needlessly high price.

In order that this report may be comprehensible to English readers all values have been given in sterling, calculated at 26*d.* to the Mexican dollar. Mexico, however, uses the silver standard, and though the silver price of labour, &c., has not altered very much the equivalent price in gold has fallen considerably of late years and remains an ever-varying quantity. It is obviously to the advantage of the English capitalist settling in Mexico that the price of silver should remain low as compared with gold; first, he receives more silver dollars in exchange for his sterling capital, and secondly, whilst most of his outgoings are in the cheaper currency, any produce exported is ultimately paid for at gold rates.

In conclusion it may be mentioned that there is probably no country in the world where the settler must more exclusively depend for success on his own energy and ability, and that it is far more difficult than in eastern countries to secure the proper conduct of a business without the constant supervision of the person directly interested in it. Moreover different problems have to be faced in different parts of the country, and in some localities coffee cultivation has scarcely yet passed the experimental stage. It is impossible to make exact calculations of the profits of an undertaking under such conditions.

The total exports of coffee from Mexico for the past 5 years are stated in the Mexican official returns to have been as follows:—

Year.	Quantity. Kilos.
1890-91	14,656,777
1891-92	11,058,279
1892-93	14,514,949
1893-94	18,866,590
1894-95	16,512,648

The principal coffee-producing States are Vera Cruz and Oaxaca to which may be added Michoacan. Colima coffee is also well-known in the market though the quantity produced there is much smaller than in even the last of the above-named States.

Mexican coffee is exported almost exclusively to the United States.

The price of coffee in the United States in the fiscal year 1893-94 ranged from 16 to 18¼ c. gold (8d to 9¼d) per 1 lb. for Rio standard (vide United States Return of Commerce and Navigation). Mexican coffee always commanded a somewhat higher price.

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(To be continued.)

THE REPRODUCTION OF THE ORANGE FROM SEED.

In your issue of April 25, 1896 (p. 527), I notice Mr. C. Wolley Dod suggests that it is generally believed by gardeners that Orange trees raised from the seed of a sweet Orange produce bitter fruit unless grafted on to the sweet Orange tree. As I am somewhat familiar with Orange-growing in Florida, having spent several years here in studying the industry, it may not be out of place for me to give some notes regarding this.

SWEET ORANGE (CITRUS AURANTIUM).

The seed from the fruit of the sweet Orange, I think, we may safely eonelude, invariably produees sweet Oranges unless they are the results of hybridisation with some other species or variety. The evidenee, however, is somewhat conflieting. The experiments of Gallesio, published in 1811, seem to show eonelusively that the belief that they produee bitter fruit, which Mr. Dod suggests is quite generally held by gardeners, is erroneous. In his *Traite du Citrus*, Gallesio says, "I have during a long series of years sown pips of sweet Oranges, taken sometimes from the natural tree and sometimes from Oranges grafted on bitter Orange trees or Lemon trees. The result has always been trees bearing sweet fruit, and the same has been observed for more than sixty years by all gardeners of Finale. There is no instanee of a bitter Orange tree from seed of sweet Oranges, nor of a sweet Orange from the seed of bitter Oranges. . . . In 1709, the Orange trees of Finale, having been killed by frost, the practiee of raising sweet Orange trees from seed was introdueed, and every one of these plants produeed the sweet-juieed fruit."

Maefadyen's statement regarding the experienee in Jamaica is, however, in opposition to Gallesio. Maefadyen says, "It is a well-established faet familiar to everyone who has been any length of time in this island, that the seed of the sweet Orange very frequently grows up into a tree bearing the bitter fruit, numerous well-attested instanees of which have eome to my own knowledge. I am not aware, however, that the seed of the bitter Orange has ever grown up into the sweet-fruited variety." Duchassaing says that in Guadeloupe the sweet Oranges often yield bitter fruit, while aecording to Dr. Ernst, at Caraeas they sometimes yield sour but not bitter fruit. Brandis, who is eonsidered one of the highest authorities on this subjeet, relates that at Khasia, in India, so far as he ean verify the fact, the extensive plantation of sweet Oranges are from the seed.

It is diffieult to harmonise these eonflieting statements. The very extensive experienee of Orange growers in Florida, California, and Louisiana entirely eorroborates Gallesio's statement. In Florida for many years the poliey has been extensively followed of growing trees from seeds of sweet Oranges, and in all eases known to the writer, sweet Oranges, usually of a very fair quality, have been produeed. Indeed, the fruit of the sweet seedling Orange trees in Florida is of superior quality to the fruit eommonly imported into the United States, and is well-known in the markets of New York, Philadelphia, &c. Probably one-forth of the Florida Orange groves, which in the season of 1894-95 yielded over one billion Oranges, are sweet seedling trees. It is so thoroughly understood that seeds from sweet fruit produee sweet Oranges of a fair quality, that no grower has any hesitation to rear extensive groves from sweet seed trees. Sinee the severe freezes of the winter of 1894-95, which killed to the ground almost all of the trees in the State, many groves which were originally budded on sweet stoek are being re-grown by allowing sprouts, which have been thrown up by the sweet seedling stock, to grow into trees without budding. This illustrates how well it is known by Florida growers that sweet seedling Orange trees produce good sweet fruit. In Louisiana and California sweet seeding trees have also been grown to eonsiderable extent, and always, so far as I can learn, with the same results that from seeds of sweet Oranges sweet fruit is produeed.

Mr. William Fawcett, director of the Jamaica publie gardens, states that, "The evidenee goes to show that Maefadyen's experienee was exceptional in finding that the seeds of the sweet Orange sometimes produeed trees with bitter fruit . . . . . The danger in planting seedlings of the sweet Orange appears to be small."* Mr. Syme also says,† "The popular opinion in Jamaica that the majority of the seeds of a sweet Orange will produee sour Orange plants is not quite well founded, though there need be little surprise felt if a goodly proportion of the trees are productive of sour fruits. It may be safely asserted that there are few good sweet Orange trees in this island (Jamaica)

* *Bull Bot. Department of Jamaica*, No. 4, Nov., 1887.
† *Bull. Bot. Department of Jamaica*, No. 42, April, 1893.

so isolated from inferior varieties, sour-fruited Shaddock, Grape-fruit, Citron, Lemon, or Lime trees as to be beyond the influence of the fecundating pollen of the latter. It is inferentially chiefly to this influence, rather than to an inherent tendency in the tissue, that many seedlings, raised from sweet Orange seed, exhibit what may be termed degenerate or unmarketable fruits."

In the Reports from the Consuls of the United States on fruit culture in their several districts, in answer to a circular from the Department of State, sweet Oranges are reported to be grown wholly or largely from seeds in the following places: Morocco, Guerrero (Mexico), Ecuador, Jamaica, Guadeloupe, Porto Rico, Syria, Sidon, Philippine Islands, Naples, Azores Islands, Spain, &c.*

Far the greater portion of the evidence, it will be seen from the above discussion, supports the belief that seeds from sweet Oranges commonly produce sweet fruits. When bitter or sour fruits result from planting sweet Orange seed, it is probable that other seeds have been accidentally mixed with them or that they are the results of accidental hybridisation. Sweet Oranges are almost invariably grown near sour Oranges, Lemons, Limes, Pomelos, &c., and it is not greatly to be wondered at that from seeds formed under such conditions a hybrid occasionally arises. Both Fawcett and Syme think this is what misled Macfadyen. Stubbs and Morgan † also mention this as one of the main causes of the variation in the quantity of seedling Oranges. That perfectly fertile seeds may be obtained by hybridising the different species of Citrus I have incidently proven in the course of pollination experiments which I have been conducting under the direction of the U.S. Department of Agriculture. The following instances may be cited :—

Parson Navel Orange (a local variety of the common sweet Orange, Citrus aurantium), which is commonly seedless, crossed with pollen from the acid Lime (Citrus limetta), produce three full seeds, which were planted, and gave four seedlings, two embryos of one seed developing.

St. Michael Blood Orange (Citrus aurantium), crossed with pollen of Grape-fruit or Pomelo (Citrus decumana) formed fifteen well-developed seeds, which were planted, and gave twenty-two seedlings. If seeds thus artificially hybridised are fertile, there is no reason to doubt that seeds accidentally hybridised may be fertile.

In each of the above cases the number of seedlings resulting is in excess of the number of seeds planted. This introduces an interesting feature into experiments of nature. It is a well-known fact that most species of citrous fruits produce several embryos, some seeds producing as many as twenty-five ; only from one to three of these, however, commonly develop. Crüger, Schacht, Hofmeister, Strasburger and others have carefully studied this interesting polyembryonic development ; and it appears, so far as we yet know, that only one of the embryos in each seed is formed by the act of fecundation, the others being what are termed adventive embryos, developing from the side of the embryo sac. It is thus probable that only the sexually-developed embryo will be influenced by the hybridisation. As two to three embryos frequently develop from a seed, even in cases of hybridisation some of the seedlings, those from adventive embryos, will probably produce true to the parent bearing the fruit.

While seedlings of the sweet Orange produce sweet fruit similar to those produced by the parent, there is yet much variation in the fruit from such seedlings. Commonly it can hardly be distinguished from the parent, but many are of much inferior quality, and occasionally one producing fruit superior to that of the parent tree may be found. This uncertainty in the quality of the fruit is what renders budding or grafting desirable in this industry as in others. There is, however, by no means so great a difference between the fruit of the common seedling and that of the best budded varieties as occurs in certain other fruits, such as the Pear and Apple. If sweet seedlings are to be grown, the seed should be taken from selected seedling trees, known to produce good fruit, which are isolated from trees of other varieties and species. By such selection one would avoid the probability of obtaining seeds affected by crossing or hybridising with other varieties, and may be quite sure that the trees from such seeds will produce good fruit.

The various improved varieties of the sweet Orange, such as the Hart's Late (Tardive), Jaffa, Majorca, Ruby, &c., cannot be depended upon to produce true through the seed. The policy of budding the trees to selected varieties cannot be too strongly recommended.

BITTER OR SOUR ORANGE (CITRUS BIGARADIA.)

Whether the bitter or sour Orange be classed specifically with the sweet Orange, or is considered as a distinct species, the fact remains that the varieties in cultivation are totally distinct in foliage, fruits and character of branching, from the sweet Orange, and that both are reproduced true through the seed. The seed of sour Oranges invariably produce sour fruit of the same general character. It is true the fruit of seedlings vary slightly in shape, size, taste, thickness of rind, &c., as in the case of sweet Oranges, but they are nevertheless distinctly sour Oranges. Gallesio says, "The sour Orange produces many seeds which always reproduce sour Oranges."

The sour Orange was introduced into Florida very early, probably by the Spanish, and escaping from cultivation, spread over the central and southern portions of the State. When comparatively recently —about 1870—interest was awakened here in the Orange industry, extensive wild sour Orange groves were found in many places. One of these, at Citra, Florida, contained some 500 acres. These wild groves have mostly been cut off and budded, so that now but few of the original trees can be found. I have examined a number of these old original trees, and have always found them to produce comparatively the same fruit. The fruit from these old wild trees, furthermore, does not noticeably differ so far as I have been able to determine, from the fruit of numerous cultivated sour Orange seedlings, one or two of which are found in almost every grove in the State. As these seedlings scattered through the groves of the State are unquestionably descendants from seeds of the wild sour Oranges found here, the identity of the fruit is significant in this connection. I have made some enquiry of pioneer Orange growers who cut off and budded many of the wild sour Orange trees, and have been unable to learn of any marked difference having been observed in the character of the fruit on different wild trees. Orange growers here invariably feel sure of obtaining sour Oranges when sour Orange-seed is planted. *Herbert J. Webber, Special Agent, United States Department of Agriculture, Subtropical Laboratory, Eustis, Florida.—Gardeners' Chronicle.*

* *Fruit Culture in Foreign Countries.* Special Consular Reports, Washington, 1890.

† Stubbs and Morgan, *The Orange and other Citrous Fruits, from Seed to Market.* Special Bulletin, Louisiana State Experiment Station, 1883, p. 12.

FERTILIZERS FOR SPECIAL CROPS.

We are frequently asked to recommend fertilizers for particular crops, and in doing so advise for one a fertilizer rich in phosphates, for another a fertilizer rich in potash, and for another one rich in nitrogen. Our friends frequently tell us that they find a difficulty in getting the special ingredient they need for the particular crop in the ordinary brands of fertilizers on the market, and especially is this so in the matter of potash. To secure the quantity of potash needed, they have to buy much more phosphate than the crop requires. As a rule this is so. The average fertilizer does not contain usually more than from six to ten per cent. of potash. Often, in order to get 100 pounds of potash to the acre, it will be necessary to buy nearly a ton and a half of superphosphate, which will contain something near 250 pounds of available phosphoric acid, which is about 200 pounds more than most crops need, and will cost from $11 to $16. The same amount of potash as is contained in this ton and a half can be had by purchasing 200 pounds of muriate of potash, at a cost of from $4 to $5. If a soil is deficient in potash, or if the crop to be raised needs a large amount, the cheapest and best way to supply the need is to buy muriate of potash or kainit. Grasses, clover, corn, and vegetables of all kinds need potash. *—Southern Planter.*

PUBLIC COMPANIES AND THEIR REPORTS.

We recently listened to a discussion relative to the respective merits of the reports issued by the tea companies connected with Ceylon. This discussion assumed the form mainly of argument for and against the directors issuing such reports either giving or withholding the fullest information. Each course found its supporters: one side holding the view that it was not desirable to make the reports exhaustive of information for the reason that the outside public became possessed of knowledge that the shareholders alone could claim, and that the last could obtain fuller detail when they desired it on application at the offices of the companies. Those who did not coincide with this view urged that the affairs of companies should be to a very large extent public property. They argued that the general public, as investors in shares, were quite as much entitled to know the conditions under which they might purchase as were the actual holders of those who desired to sell them. We must say that we agree in the last-stated opinion. All companies are from their very nature public, not private affairs. Directly a registered company claiming limited liability submits either to public quotation or makes appeal by circular or by advertisement to general investors, it can no longer, in our opinion claim to keep back any material facts from public knowledge. Let us consider in this connection the position of any person who may be desirous of purchasing shares in a company. He sees in the lists published daily the quotation of such shares. What has he to guide his judgment as to whether that quotation is or is not to be justified? He can only rely upon the judgment of others who have been willing to pay the price quoted. In fact, he has to rely entirely and solely upon the public confidence as expressed by the published quotations. But he must certainly be entitled to such information as might enable him to form his own independent judgment; and this—not already being a shareholder and unable to claim detailed information at headquarters—he can only obtain from the directors' reports. He therefore naturally, if exercising due caution before investing, turns to these. Now these reports as issued are of strongly divergent character. Some directors, as we think rightly and wisely, issue reports affording the fullest possible detail. Others, on the contrary, seem to seek to make them as bare of information as they possibly can do. They aim, as it seems to us, not at brevity only, but at making them as bald and colourless as is possible. Surely the latter course cannot be fair towards the public interests concerned. And we hold even a stronger view than this. We say that directors cannot be justified in their adoption of such reticence as to the affairs they direct. There is given to them a very great, and, in some respects, a dangerous privilege. They may incur indebtedness to any amount they may see fit, while they are relieved as to responsibility for it beyond a certain limitation, that of their available capital as represented by individual investment. Surely the exercise of this privilege demands a *quid pro quo* for the public who may trust them; who may, on the faith of the directors holding nothing back, supply them on credit with goods or cash. It is not therefore the shareholders alone that should receive full confidence. Other interests outside of that body demand it, but these have not the power of examining into details. When, therefore, we see a report that evidently aims at withholding that full confidence, we feel our pursestrings tighten as regards the company issuing it. It is not for the directors to urge that full revelations might affect the value of their shares. They claim and possess a privilege which can only be due to them so long as everyone is enlightened as to their position. Limited companies can in no sense be private. Publicity is the condition of their being.

MORE CEYLON TEA COMPANIES:

GREAT SUCCESS IN THE FLOATING OF THE GALLAHA ESTATES AND AGENCY CO.

The financial papers by this mail announce the registration of the "Midland (Ceylon) Tea Plantations Co., Ld.," with a capital of £60,000 to acquire and work the well-known properties of Gneiss Rock and Strathellie; but this will be regarded as old news in Ceylon as it was in "the Lane," on being referred to. The Company is evidently a private one chiefly, and the provision of the full amount of capital required a foregone conclusion before registration.

More important, with reference to the credit of the Colony, is the very successful way in which "The Gallaha Ceylon Tea Estates and Agency Co., Limited," with a capital of £165,000, has been floated. True, the vendor Mr. Charles Strachan, reserved to himself the whole of the *Ordinary* shares (£50,000) as part of the purchase money—a fact which must have given special confidence to applicants for the Mortgage Debentures and Preference Shares. But, in reality, no applications for debentures were required, the whole (£55,000) having been subscribed for privately—indeed many times over, we believe—before the issue of the prospectus, although the interest was placed at 5 per cent. All, therefore, that was offered to the public, with less than two days allowed for application, were the £60,000 of six per cent preference shares; and considering the circumstances, it is perhaps not surprising, though very satisfactory, that the amount required was at once subscribed fourfold. This, certainly, betokens full confidence in our Tea Enterprise and the continued prosperity of Ceylon. It will have been noted from the prospectus that the area under tea and cardamoms has been priced at the comparatively moderate rate of £47 5s per acre; and with so extensive and well-equipped a Factory as that on Gallaha and the Colombo business, centrally situated, under a Manager so well-known for his experience and sound judgment, a prosperous career for the Company may well be anticipated.

Both the Midland and Gallaha Tea Companies have our best wishes for their success.

J.F.

CACAO IN MEXICO.

In the interesting report by Sir Henry Dering on the "Cultivation of Cacao in Mexico," reproduced in the *Journal of the Society of Arts* for June 19, p. 659 it is stated "The species of cacao tree most cultivated in Mexico are—Cacao, or *Theobroma ovalifolia*, *T. bicolor*, *T. augustifolia*. There are other kinds known, generally found growing wild, which come under the head of the Guazuma or guacima, *Guazuma polypotrya* being the principal species.." The latter part of this extract puzzled us a good deal, and we addressed a letter on the subject to the Foreign-office, and asked for specimens. These having arrived we found that they belonged entirely to *Theobroma bicolor*, and had no relation whatever

to the genus Guazuma, as stated in the report. The point is, that that there are no other kinds of cacao growing wild which come under *Gauzuma polybotrya*, or any species allied to it. As information of this kind ultimately finds its way into text-books, and becomes incorporated into the literature of cacao, the Director thought it desirable to draw your attention to it, in order that the readers of the *Journal* may be placed in possession of the further facts recently obtained from Mexico.

D. MORRIS, Assistant Director.

Kew, 20th June, 1896.

—*Journal of the Society of Arts*, June 26.

THE YATIYANTOTA AND WE OYA TEA COMPANIES.

PROPOSED AMALGAMATION.

At present negotiations are in progress for the amalgamation of the two well-known Ceylon Tea Companies—the Yatiyantota and We Oya. The subject is under the consideration of the Directors of the respective Companies, and in due course any scheme of amalgamation which may be approved by them will be submitted to the shareholders. Of course, until this is done, nothing can be decided, but we learn, that it is proposed that the amalgamation should take place as from 1st January next, which is the end of the financial year of both the Companies concerned.

THE APPLE-TAINTED TEA QUESTION.

The London correspondent of our contemporary says:—

The Tea and Produce Committee of the Ceylon Association in London will meet on Monday next to go into the matter of the claims for tea tainted by apples that I recently made mention of, and to consider a letter from Messrs. Anderson Anderson & Co. Already warning has been sent to Ceylon to avoid ships laden with the pippins we so greatly appreciate here, and the attitude that Messrs. Anderson Anderson & Co., take up make this the more advisable. I hear they state that it is a mistake to think that the tea entered for wharves was delivered from the ship over-side direct into barges. They say it was landed and lay for a time in the shed with the rest. That exactly the same precautions were taken by the "Cuzco" and the "Austral" to protect the tea from damage as have been taken always both before and since the complained of cargo. And they claim that except in the case of the two above-named ships no suggestion of damage has been made. They say that on every occasion up to now the tea and apples have been stowed in special holds with watertight bulks between them. They make the admission that one of the passengers per the "Austral" sent to the ship with her baggage a box containing about a dozen apples. This was placed in one of the holds with the rest of the passenger's baggage, not being recognised as containing apples. They say it is impossible for a dozen apples to have tained several thousand packages of tea. But if one passenger sent a dozen apples which were not recognised, might not fifty passengers have wished to bring home as presents more or less of the fruit and their cases also have been passed into the passengers' baggage hold? But whether one or fifty passengers had fruit on board Messrs. Anderson Anderson & Co., consider that having regard to the terms of their bill of lading the ship would not be liable. The matter is, of course, in the hands of their lawyers, and it remains to be seen what stand they will take when the matter has been handled by the Tea and Produce Committee.

IMPROVED CEYLON TEA.

[FROM AN OCCASIONAL CHICAGO CORRESPONDENT.]

We have been favored with something entirely new and different in the tea line. While it is a Ceylon tea, it is so entirely unlike all other Ceylon teas that no comparison should be made. Lovers of good teas are indebted to Messrs. Franklin MacVeagh & Co., Chicago, for this article. The way they became possessed of it was in the following manner:

For years they realized that Ceylon grew a very grand tea, and beginning with the close of the World's Fair they commenced corresponding with leading growers of teas in the island of Ceylon, with the aim of getting them to prepare or cure a tea that would be suitable to the American trade.

In the past, Ceylon's trade had been from the British Isles and Australia. These countries use five times the quantity of tea per person that is used by the American people—in fact, these countries use tea the same as we use coffee, and their aim has always been to get a tea to take the place of coffee; consequently, they prepare a fermented tea, and the greater the fermentation the better they like it, as it makes a tea very heavy and malty; but this very taste, we found, was disliked by all American tea-drinkers. We are very partial to a light, flavory, delicate tea.

Samples were sent to Ceylon of the very higher grade of Formosa Oolongs, China, Greens and Japans, to show what kinds of teas were liked in America. This was back in the fall of 1894. The Ceylon factors commenced and made a great many experiments, but not until two years afterwards were they able to cure a tea that had all the fine aroma left in it, and did not possess that malty, bitter taste that goes with a tea prepared for the English market. To get the beautiful bouquet that this tea has, it must be grown in the mountain district, as a high altitude is absolutely necessary to grow this kind of a tea.

There is something very different in this tea from all other teas. Some people, the first time they drink it, do not like it on account of its being so unlike the tea they have been using for years; the second time they drink it they do not dislike it, but the third time is the charm. It has a delicious bouquet and mellowness that no other tea possesses, and after it is drank a few times, one becomes a lover of it in a greater degree than of any tea that has ever been before the public.

It is a wonderfully economical tea also, as not over one-half the usual quantity is necessary; if you use a teaspoonful to a cup of other teas only use a half tea spoonful of this tea.

To briefly summarize: This wonderful tea is grown and specially prepared for the American trade. It is the only unfermented Ceylon tea on the market. It steeps a beautiful bright-colored liquor, and has great fragrance. It is not malty and bitter, as all Ceylon and India teas are. BRUNO.

[We publish the above as a matter of trade news. Many believe that the tea of the future is to come from Ceylon and India. We have tested the above tea and find it of fine flavor, light liquor and nearly free from the pronounced sweetish taste characteristic of most of the Ceylon and India tea. It is claimed, and upon a sound basis, that frequent use of these teas will overcome that prejudice which first comes to the user of Ceylon and India tea, and that the user will become wedded to it and never go back to his old favorite. We are not yet a convert from the use of fancy Formosa, but we know others that are. Investigators can probably secure a sample of the tea described by "Bruno," by addressing Franklin MacVeagh & Co., Chicago, and mentioning this article.—ED.]—*American Grocer*, June 10.

"THE AGRICULTURAL LEDGER."—From the Government of India we have received Nos. 18 and 20 of 1895 and Nos. 5, 6 and 7 of 1896 of this valuable publication. No. 5 of 1896 contains a reprint of Mr. David Hooper's note on camphor leaf oil (which we printed some time ago), and an introduction by the editor, Dr. George Watt, which we give elsewhere.

THE HANKOW TEA SEASON

"Wet weather has seriously affected the first crop teas, as regards both quality and quantity."
CHESTNUT.

From distant Hankow goes the groan
That the first crop is damaged by rain:
So well may the poor chaasze moan,
As grows dimmer his castle in Spain,
As he traverses Yangtze's fair vale
A voice that is small, still and low
Gently whispers "No longer bewail:
Solve the question of weather or no"—

Then into his tea room he dives,
Infuses his musters with care,
And hopefully, manfully strives
To discover the pekoe that's there—
In vain for the flavour of old
He searches, but finds it's no go:
An aroma of graveyard and mould
Leaves no question of weather or *no*—

Yet he makes the tea strong in the cup,
Free from dust, and well twisted the leaf,
The discovery quite bucks him up
As he throws off a sigh of relief—
His orders, he finds, "bid him pause;"
Distinctly they say "Sure and slow;"
Yet in them is no saving clause
On the question of weather or *no*.

But the ice now once broken, he goes
Imbued with the spirit of fun,
Overboard his clear orders he throws,
And settles a *daisy* Keemun.
Then follow some tarry Lylings,
And Oonams of a quality low:
He smiles as he gleefully sings
Regardless of weather or *no*.

Then he ships a nice *frowsy* Ningchow,
And some slightly *Oopacky* Oopacks,
Follows suit with a *rosy* Hohow,
Which consignees' pockets may tax:
He works just a bit with the view
That the dearer lots back he may throw,
So that when his inspecting is through
He's prepared to face weather or *no*.

Furious and fast is the race,
The speed's far too hot to last long,
The export goes creeping apace
And still he is *going it strong*.
The oof bird which lays eggs of gold,
We are killing as fast as we know,
Our shipments are bound to be sold,
In spite of the weather or no.

But in London the *stuff* is received
By our friends with a look of despair;
"How could you thus us have deceived
With cables and promises fair?
Your teas the Trade scarce deign to taste,
But despite your loud, jubilant crow,
We shall quit them with leporine haste,
And *whether* you like it or *no!*"

—*N. C. Herald*, June 26.

INDIAN PATENTS.

Whereas the inventors of the undermentioned inventions have respectively failed to pay the prescribed fees, it is notified that the exclusive privilege of making, selling, and using the said inventions in British India and of authorising others so to do has ceased:—

IMPROVEMENTS IN AND CONNECTED WITH THE PROCESS OF EXTRACTING COCOA.—No. 343 of 1891.—Messrs. E. O. Moser & Co.'s invention for improvements in and connected with the process of extracting cocoa or rendering it soluble for the preparation of soluble cocoa or the manufacture of cocoa powder, chocolate and the like preparations. (Specification filed 31st March 1892.)—*Indian and Eastern Engineer*, July 18.

ANNUAL REPORT OF THE ROYAL BOTANIC GARDEN, CALCUTTA, FOR THE YEAR 1895-96.

No. 16G, dated Royal Botanic Garden, Sibpur, the 12th May 1896.

From—Brigade-Surgeon-Lieutenant-Colonel George King, M.B., LL.D., F.L.S., F.R.S., C.I.E., Superintendent, Royal Botanic Garden, Calcutta,

To—The Secretary to the Government of Bengal, Financial Department.

I have the honour herewith to submit the 109th Annual Report of the Royal Botanic Garden, Calcutta.

The weather of the official year 1895-96, was remarkable for the great dryness of the months from October to March. Not only did the rainy season end prematurely, but the showers which are not unusual about the beginning of January entirely failed this year, and there was not a single storm from the north-west. The result of this excessive dryness on the plants growing out of doors has been disastrous. In spite of all efforts in the way of artificial watering, many small plants have died; and many trees, even of large size, will be disfigured by the loss of branches which have withered. The excessive dryness of the air during the few weeks when the majority of the orchids came into bloom had the double effect of reducing the size of these beautiful flowers, and of hastening their withering. The flowering-trees out of doors were also stimulated into putting out unusually large numbers of blossoms of smaller size than usual. The solitary benefit derived from the drought was that the water in the Garden lakes fell so low that it was possible, by cutting some of them off from the supply of water lifted from the river by the steam-pump, to run them quite dry, and thus to obtain from their beds a quantity of earth which will be of great use in raising the levels of numerous roads which are much in want of being heightened. Chief amongst such roads is the avenue leading from the river entrance to the Banyan tree. This, which is more than a third of a mile long, is one of the most prominent in the Garden. Towards the middle of it the level sinks, so that the roadway is below the surrounding ground. This depression not only produces an unpleasing effect, but it forms a cup in which water freely collects during the rains. By means of the earth recovered from the lakes near the road, I hope, during the year now entered upon, greatly to improve this avenue, as well as the ground on each side of it. During the year the Dyer and Falconer Avenues had their levels raised and were repaired, the soling bricks and burnt-brick metal required for the purpose having as usual been made within the Garden. With the relaying of the two avenues just mentioned, the eastern half of the Garden has now been well supplied with good roads. Much, however, still remains to be done in the western half. The Banyan avenue will probably be taken in hand during the current year, but it will not be possible to do more. The Roxburgh Avenue which is in very bad condition during the greater part of its length; the Thomson Avenue, which is almost unfit for wheeled traffic; and various shorter roads will have to lie over for future occasions when special grants of money can be spared. During the cold weather the new road running from the Shalimar Point to the garden was opened for traffic by the Public Works Department; and, with its opening, people coming to the Garden by land began to enter it by a gate which was previously but little used. Anticipating this change, I had for some years back been improving the Garden in the neighbourhood of that gate. During the current year the final touches were put upon that part of the Garden, and it is now one of the prettiest spots within its boundaries. The gate itself is however rather mean and small, and a larger one ought to be provided as soon as funds permit. A year or two ago the platform on which Kyd's Monument stands was paved with marble, Sir Charles Elliott having made a special grant of money for the purpose. Last year, by a similar grant, marble steps to the platform were provided in supersession of the forme cemented ones. No buildings were erected in the Garden during the year. I had hoped to have been able to build a new plant-house in the Nursery, but funds were not sufficient. Such a house ought to be put in hand as soon as possible. A glass-roofed house for the display of ferns is still also one of the desiderata of the Garden. Few ferns thrive well in the grass-roofed conservatories which have proved so perfectly suitable for orchids, palms, and other plants,

In consequence of there not being a glazed conservatory, the public never see the Garden fern collection, which has to be kept in nursery houses near the Curator's quarters. Towards the end of the official year much was done towards thinning the large area planted with trees to the south-west of the great Banyan. During the year an interesting addition to the Garden trees was made in the shape of a rooted cutting of the sacred *Bo* tree of the temple at Budha Gaya, under a predecessor of which Sakra Muni, the founder of the Buddhistic faith, lived and taught. This interesting historic and religious relic was presented by Mr. G. A. Grierson, PH.D., lately Magistrate of Howrah. It has been planted on an island in the large lake near the big Banyan, from which, when it grows up, it will be well seen, and at the same time it will not be easily accessible.

2. ECONOMIC PLANTS.—At the request of the Reporter on Economic Products to the Government of India, patches of two species of *Sida* were cultivated in the Garden, with the view of testing the value of their fibres for weaving and cordage. The crops grown on these patches were made over to the officer just mentioned. At his request also quantities of young plants of *Adhatoda Vasica* were prepared in the nurseries for issue to tea-planters, a decoction of the leaves of this plant having a popular reputation as a powerful insecticide. A few experiments were made in the nurseries by the Curator, Mr. R. L. Proudlock, with the view of testing the merits of this decoction. The results, however, were of a somewhat doubtful nature. The demands for *rheea* plants were less numerous than in former years, and the distribution during the year was proportionately small. Many hundreds of fruit and timber trees were issued to public officers in all parts of the Province. The Director of Land Records and Agriculture, having been for some time desirous of obtaining a botanical report on the various races of wheat grown in Bengal, and being unable to supply adequate materials for a study of the subject, it was suggested that a portion of the Sibpur Experimental Farm should be devoted during the cold weather of 1895-96 to raising wheat from samples of seed supplied from the various wheat-growing districts. This suggestion was acceded to by Mr. Macpherson, and Dr. Prain has during the cold season made observations on the samples of wheat grown in the plot of ground thus placed at his disposal. His report on the races grown, and on their relationship to the names they bear in the different districts, will be in the hands of the Director of Land Records and Agriculture at an early date.

2. HERBARIUM.—Work in the Herbarium was carried on with vigour; and during the year 17,403 specimens were received, while 11,093 carefully-named specimens of Indian plants were issued to various scientific institutions all over the world. The chief donors to the Herbarium were the Director of the Royal Garden, Kew, who contributed 1,974 specimens, and the Keeper of the Botanical Department of the Natural History Museum, London, who transmitted 1,129 duplicate specimens not required by that institution. From Dr. Engler, Conservator of the Royal Herbarium, Berlin, were received 512 specimens, and from the authorities of the Botanical Museum of the University of Vienna 1,000. Dr. Hans Schinz, Director of the Botanic Garden at Zurich, contributed 558; and the veteran Baron Von Mueller, Government Botanist in Melbourne, augmented his former munificent donations by 106 specimens during the past year. From American botanists large contributions were received; the Smithsonian Institution at Washington having sent 1,134 specimens, while Messrs. Pringle contributed 431 Mexican specimens, Mr. Heller 344, and Mr. Nash (of Columbia College, New York) 703 specimens. The Government of the Straits Settlements contributed 850 specimens, collected chiefly in Malacca: and Mr. E. H. Man, to whom for many previous years the Aerbarium has been greatly beholden, sent 257 from the Andaman Islands. Among officers of the Indian Forest Department who made presentations, there have to be mentioned Mr. J. Sykes Gamble, an old and valued contributor, who last year sent 456 specimens from Dehra Dun; Mr. W. A. Talbot, who sent 29 from Canara; Mr. R. L. Heinig, who sent 8 from the Sundarbans; and Mr. J. H. Lace, who sent 180 from the extreme North-West Himalaya. From Mr. J. A. Gammie, of the Government Cinchona Plantation, 172 specimens were received; while his son, Mr. G. A. Gammie, having made a tour in the Sundarbans with the Forest Officer of that Division, brought back 509 specimens jointly collected by Mr. Heinig and himself. To the Director of the Botanical Survey of Northern India (Mr. J. F. Duthie) the Herbarium is indebted for 669 specimens contributed during the year; while the late Mr. M. A. Lawson, Director of the Botanical Survey of Madras, sent 300 species from Travancore; and Mr. Marshall Woodrow, Director of the Bombay Botanical Survey, sent 34 species collected in the Deccan. A large number of specimens numbering 3,068) were brought in by native collectors working under the supervision of Mr. R. Pantling, of the Cinchona Plantation; while 578 were got from Abdul Kholil, a native collector working in the Shan Hills. The chief recipients of the named plants issued from the Herbarium during the year were the Director of the Herbarium at Kew; the Keeper of the Botanical Department at the British Museum; the Directors of the University Herbaria at Edinburgh, Aberdeen, Cambridge, Berlin, Zurich, Florence, Vienna, Utrecht, Leiden, Upsala, and Melbourne; the Directors of the Botanic Gardens at Buitenzorg (in Java), Singapore, Peradeniya (Ceylon); M. C. De Candolle, Geneva; the Director of the Museum of the Jardin des Plantes, Paris; the Committee of the Smithsonian Institution, Washington; the Directors of the Botanical Survey of Northern India and of the Government Museum at Perak, of the College of Science, Poona, and of the Museum at Madras. Full lists of both receipts and issues will be found in Appendices V and VI of this report.

4. *Botanical publications*.—During the year the first part of the fifth volume of the *Annals of the Garden* was published. This part is occupied by detailed descriptions and figures of a hundred species of new and little known Indian orchids by the illustrious and veteran botanist, Sir Joseph D. Hooker. Sir Joseph has been engaged, as Government are aware, for the past five and twenty years on the preparation of a *Flora of British India*. In the course of his elaboration of the family of *Orchidaceæ* for that monumental work, he had at his disposal the whole of the materials of the Calcutta Herbarium, including the coloured drawings made by the Garden artists. These drawings, which have been accumulating since nearly the beginning of the century, were found by Sir Joseph so useful that he recommended the publication of a selection of them, and generously undertook to supply the descriptions himself. The result is his *Century of Indian Orchids*, which forms the first part of the fifth volume of our *Annals*. Towards the end of the year there was also published the first part of the sixth volume of these *Annals*. This part is occupied by an account of a very important research in vegetable physiology by Dr. D. D. Cunningham, Professor of Physiology in the Medical College, Calcutta. Dr. Cunningham devoted much of his leisure time during a period of several years to making observations of, and experiments connected with, the phenomena popularly known as *sleep* and *sensitivity* in plants. The results of these reserches go to prove that the great majority, if not all, of the transient spontaneous movements of the higher vegetable organisms are dependent on purely physical processes. The memoir is a most exhaustive one and is illustrated by drawings from Dr. Cunningham's own pencil. In the same part of the *Annals* is also included an account, by the same author, of a destructive vegetable blight. Dr. Prain, Curator of the Herbarium, contributed the following papers to various scientific journals:—*On* Milula, *a new genus of Liliaceæ from the Eastern Himalaya* (in *Scientific Memoirs by Medical Officers of the Army of India*); *An account of the genus* Argemone (In the *Journal of Botany*); *A Revision of the genus* Chelidonium (in the

Bulletin de l' Herbier Boissier); *Le genre* Microtoena (in the *Bulletin de la Societe Botanique de France*); *Noviciæ Indicæ*, IX and X. *some additional* Papaveraceæ and *some additional* Fumariaceæ (in the *Journal of the Asiatic Society of Bengal*); as well as some minor teratological and morphological communications to the same Society. Finally, in the *Journal of the Asiatic Society of Bengal*, I published the eighth portion of my *Materials for a Flora of the Malay Peninsula*; and in the same journal appeared descriptions of thirty-three new species of Sikkim orchids, by Mr. R. Pantling, of the Cinchona Plantation, and myself.

5. LIBRARY.—A few books were added to the library, both by purchase and in exchange for copies of the Garden *Annals*.

6. INTERCHANGE OF PLANTS AND SEEDS.—Full details of the issues and receipts of these will be found in Appendices, I, II, III, and IV; the total issues having been 30,898 plants and 2,384 packets of seeds, and the receipts 14,342 plants and 1,177 packets of seeds. Amongst the collections of living plants received during the year the most interesting, from a botanical point of view, was that made in Assam by Dr. G. Watt, C.I.E., during a tour which he made in that province in connection with his researches into tea blights. Dr. Watt's collection consisted of no less than 1,215 plants, many of them of much interest.

7. *Lloyd Botanic Garden, Darjeeling.*—This Garden was worked during the whole year by the Curator, Mr. W. A. Kennedy, who, besides his duties in the Garden, has charge of the Shrubbery grounds and of the trees planted in various parts of the station. During the year Mr. Kennedy carried out various improvements on the roads and conservatories within the Garden. A very remarkable plant was added to the Darjeeling garden during the year, namely, a gigantic specimen of the beautiful Australian fern, *Todea barbara.* This plant was the personal gift of the distinguished botanist, Baron Ferdinand Von Müller, K.C.M.G., F.R.S., who for many years has been the highest authority on the botany of the Australian Colonies. Baron Von Müller has in past times presented many valuable plants to the Calcutta Garden, but this, his latest gift, outrivals all his previous contributions. The *Todea* which now adorns tho Darjeeling Garden was removed by the Baron, at his own expense, from a lonely valley far distant from his residence in Melbourne. It weighs upwards of half a ton, and ought, when it has had sufficient time to explain its leaves, to form a magnificent object.

8. The budget allotments of funds, both for the Calcutta and Darjeeling Gardens, were spent in full. The proceeds of the sale of surplus plants and seeds, amounting to R1,107-1-6 for the Calcutta Garden and to R1,014-8 for the Darjeeling Garden, were paid into the Government treasuries as usual.

9. Dr. Prain (who had been on furlough to Europe) returned to duty in June, and since then he has been in charge of the Herbarium. On 1st July Dr. Prain was appointed Professor of Botany in the Calcutta Medical College in place of myself, Government having allowed me to retire from that appointment. During Dr. Prain's absence the Herbarium work was carried on by Mr. G. A. Gammie (of the Chinchona Plantation), who on Dr. Prain's return reverted to his own appointment at Mungpoo. For the first eleven months of the year Mr. R. L. Proudlock held the appointment of Curator of the Calcutta Garden. Towards the end of January he was transferred to tho Curatorship of the Government Garden at Ootacamund, and his place here was filled by Mr. Lane (the Assistant Curator), who returned during the year from Allahabad, where he had held an acting appointment. Mr. Lane's place on the staff of this Garden was in turn filled by Mr. Davies, who had previously been a probationer under the new scheme for providing a corps of gardeners for India. Mr. Proudlock's advancement to the Ootacamund Garden thus gave the means of giving well-merited promotion to Messrs. Lane and Davies, whose work during the year has been very satisfactory. The offices both of the Botanic Garden and of the Cinchona Plantation have, during the year, been in charge of Babu Gopal Chandra Datta, who has worked with his usual assiduity.

10. The usual appendices (six in number) which accompany this report give full details as to the distribution of plants, seeds, and Herbarium specimens.

SEED FROM ARABICA-LIBERIAN GRAFTS.

Some few years ago a considerable amount of interest was taken in the subject of grafting the delicate but valuable Arabica on to the robust stock of the hardier Liberian. From an account of some interesting and possibly very valuable experiments in this direction carried out on a plantation in Coorg, we learn the cherries gathered from the grafted plants show marked differences to the ordinary Arabica. They are large, heavy, with a thin covering of skin and pulp, the very desirable result of enlarging the bean and reducing its .covering the beam and reducing its covering being the first decided score for the grafts. Some of this seed has been planted, and the habits of these are being watched with care. The results will be extremely interesting to learn. The theory of grafting, as far as we understand it, does not, it is true, promise very much, early and heavy cropping being the general results of the practice, with the added constitutional strength of the usually hardier stock. Usually the scion in this case the Arabica, would be true to the plant from which it was taken; but the abovo instance is a decided exception. If the seedlings follow in the same footsteps, there is no telling what discoveries may yet be in store for us. Some experiments in Arab liberian hybrids are also being carried on by the same enterprising gentleman. By the way, how is it that we have heard nothing of late of Mr, Brooke-Mockett's Mysore hybrids the accounts of which created such a stir a short two years ago?—*Planting Opinion*, July 18.

A GOOD CUP OF COFFEE.

The cultivated coffee tree or shrub, writes Anna G. Murray, in the Topeka *Capitol*, is an evergreen growing from four to five feet high; its jasmine-like flowers forming in clusters at the root of shiny leaves, give forth a delicious odor. The fruit, like a purple cherry, consists of a sweetish pulp and two seeds, that lie in this pulp, face to face. The crop averages one pound of beans to each tree, though in the prolific West Indies and Brazil, where shrubs can be forced to bloom eight months in the year, three crops is not unusual. Coffee is not native to Central America or the Indies, the first plants having been brought to Martinique in 1720, from a layer originally imported from Mocha, and propagated by the Jardin des Plantes of Paris. It is native to Abyssinia and Ethiopia, where leaves as well as the bean have been used from time unknown. It has never been cultivated to any extent in North America, though there is an indigenous tree, dubbed "Kentucky coffee tree," because the seeds were formerly much used by Kentuckians instead of the imported coffce. A recent experiment in Iowa with Rio grains has proved, however, that it is possible to raise an excellent grade of the genus in the United States.

A German physician was the first to land coffee as a beverage to the people of Europe, in 1573, and it is to another German traveler that Europe owes the original coffce plants transplanted from the East. The first cargo of coffee was landed in 1809. Coffee delights in a moist atmosphere, and in dry climates profuse irrigation is necessary to the plant. After picking, the ripe cherries are soaked in cisterns, then dried by sun flooding floors specially adapted to the purpose.

The dried pulp is then separated from the seeds by a process of sifting, shovelled into sacks and conveyed to the coast towns, where it is roasted and shipped. The universal use of coffee owes itself to the public coffee houses, the first in Europe being that of Constantinople in 1551. In Turkey coffee is so much a necessity that refusal to supply it

constitutes a cause for divorce. Writing in 1624 Francis Bacon says: "They have in Turkey a drink called coffee and this drink comforteth the brain and heart and helpeth digestion." Still London did not have a public coffee house until 1652 and Paris 1672. Immediately coffee houses arose in every European city. According to Macauley, writing in the early years of this century: "Coffee houses were the chief organs through which public opinion vented itself and every man of the upper or middle classes went daily to his coffee house to learn the news and discuss it." About the same time Sydney Smith was also proclaiming "If you want to improve your understanding, drink coffee." The fact remains that coffee is better prepared, as well as copiously used instead of other stimulants in continental cities than in Great Britain. In 1809 an extensive cultivation of the coffee plant was begun in England under the advocacy of Bishop Compton. Another Englishman, George Bird, was the pioneer coffee planter in Ceylon (1820).

Because of its stimulative properties the use of coffee is prohibited generally in fevers. It is an excellent disinfectant. Place a couple of red-hot coals on a fire shovel, then sprinkle two or three spoonfuls of coffee over them and the aroma will not only sweeten the room, but prevent the spread of disease. In the French colonies, where coffee is greatly used, gout is said to be unknown. Arctic explorers, men accompanying caravans, as well as soldiers, claim they can endure more fatigue under the stimulus of coffee than fermented liquors.

Unfortunately, there are coffee drunkards just as there are kerosene, parafine, castor oil and cod-liver oil drunkards. Coffee was forbidden as a drink by the Koran. Intemperate creatures have been known to drink from fifteen to twenty-five cups of coffee per day. Not unnaturally tapering off has occasioned much the same mental and physical derangement as the alcohol habit. Recently a Nebraska woman had an acute attack of delirium tremens, when forced to forego her accustomed twenty cups per day.

The adulterants of coffee are ground wheat, rye, dandelion root and chicory. Perhaps because it has been deemed harmless and deepens the color, the use of chicory has been legalized. There is another substitute, called Swedish coffee, but we do not find much of it in this country. The French favor the essence of coffee. In Sumatra natives use the coffee leaves the same as we use tea leaves. Coffee is a most economical food, for it will support life on a less additional quantity of solid food than would otherwise be required.

It has been computed that each person in the United States consumes in the year nine and one-half pounds of coffee.

To make a good cup of coffee is not so simple as it reads. A mixture of two kinds of beans—two-thirds Java and one-third Mocha—produces most satisfying results. Apropos, only a small quantity of Mocha finds its way past Constantinople. Miss Parloa claims the best coffee comes from Guatemala.

Beans should be freshly roasted when feasible. At least, heat the beans before grinding and do not grind too fine. Do not be afraid—use a full cup of beans to a quart of water. Mix the egg well with the dry coffee and above all be sure that the coffee-to is clean.—*Interstate Grocer.*

"ACME" TEA CHESTS.

In these days when a scarcity of momi tea chests threatens to become a serious evil, the advantages of the "Acme" steel chests, made in three sizes by the Acme Package Co., Ltd., of Glasgow, have been brought to our notice. That these chests are coming into favour is evidenced not only by the testimonials in their favour, but by the fact that 1,750,000 lb. of the Indian season's tea of 1894 was carried in Acme chests. Chests for 10,000,000 lb. of 1895 season's tea have been supplied, and the orders which are now being placed indicate that the quantity in 1896 will be three times as much. It is claimed for the Acme chests that they show an advantage over wooden chests of from 1s4d to 3s 5d per 100 lb. of tea. Messrs. Finlay, Muir & Co., who are the agents for Ceylon, have a supply in stock; and, to meet a growing demand, a large quantity has been indented for.

CEYLON PATENTS.

The following Grants of Exclusive Privilege have been granted under the inventions Ordinance during the half-year ended June 30, 1896:—

No. 481.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in apparatus for packing tea or other substances into chests, boxes, or other receptacles. —January 21, 1896.

No. 486.—To Edwin Rice Wiggin, of Lindula, and John Grieve, of Hatton, for improvements in machinary for rolling tea leaf.—January 24, 1896.

No. 491.—To Oilliam Jacksen, of Thorngrove, Mannofield, Aberdeen, North Britain, engineer, for improvements in apparatus for rolling tea leaf and the like.—February 23, 1896.

No. 489.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in multitubular air-heating apparatus. —February 28, 1896.

No. 495.—Jules Lemichel, of 52, Rue Lourmel, Paris, in the Republic of France, engineer, for improvements in or connected with apparatus for raising liquids.—March 12, 1896.

No. 487—.To William Jackson, of Thorngrove, Mannofield, Aberdeen, North Britain, engineer, for improvements in apparatus for subjecting materials to the action of hot air, more especially intended for use in drying tea leaves and other produce only in so far as the action of an iron bar for spreading the tea leaves on their descent from the upper to the lower tray is concerned.—April 28, 1896.

No. 494.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland. merchant, for improvements in apparatus for limping or withering tea leaf or for drying vegetable or other substances. May 16, 1896.

No. 490.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in stoves or apparatus for heating air. —May 16, 1896.

No. 502.—To Taylor Burrows, of 88, Upper Kennington lane, London, England, engineer, and Horace St. John Kelly Donisthorpe, of 73, West Cromwell road, London, England, gentleman, for improvements in apparatus for removing the fleshy or pulpy or non-fibrous material from leaves, stems, or plants to extracts the fibre therefrom.—June 16, 1896.

No. 506.—To John Melville Boustead, merchant, Cololmo, Ceylon, for an improved apparatus for desicating.—June 30, 1896.

No. 498.—To Robert Jamieson Browne, electrical engineer, at present electrician to the British India Steam Navigation Company, Limited, of 16, Strand road, Calcutta, in the Province of Bengal, East India, for punkah pulling or causing any such similar oscilating motion.—June 30, 1896.

THE GERMANS BECOMING A NATION OF TEA DRINKERS.—The *Chemist and Druggist* of June 13 says:—

There are signs that the Germans will gradually abandon their old habit of taking coffee, and become a nation of tea-drinkers. Tea is already the fashionable refreshment of the upper classes, and is gradually obtaining favour in more plebeian circles. This is partly due to the deterioration in the quality of coffee and partly to the increase of coffee substitutes such as "malt-coffee," consisting of slightly malted and lightly roasted barley, sometimes sweetened, and retailing at twopence a pound. Few articles, it would seem, have a better future in Germany than tea.

CEYLON TEA COMPANIES--UNDER CRITICISM.

"CEYLON Tea Companies" is the title of an article in the July issue of the *Investors' Review*, (see below) which has of late sprung to the front rank of independent financial and critical authorities in the Metropolis, through energy, keen intelligence, and the fearlessness of its editor, Mr. A. J. Wilson—himself a hard-headed Aberdonian. Apart from the general article—supplying useful statistical information and discriminating criticism as well as practical suggestions—we have, under "Company Notes," separate treatment of the affairs of no fewer than four of our leading plantation Companies in "The New Dimbula," "The Ceylon and Oriental Estates," "The Ceylon Land and Produce," and "The Eastern Produce and Estates." We copy elsewhere all that is said under these headings as well as the main article, save the four years' table of export and distribution of Ceylon tea to different countries already familiar to our readers. It is of special interest to see what a trained, first-class metropolitan critic has to say about our tea industry from the financial point of view, and of the position of certain leading, if not representative, company-constituents in that industry. Remembering that the *Investors' Review* and its editor are "nothing if not critical"—"that 'tis his vocation" to pick holes,—that directors, managers and shareholders coming under its or his ken may be assured in the words of Burns,—

"If there's a hole in a' your coats
I rede, ye tent it!"

—it is satisfactory to find that on the whole the critic is fairly well-pleased, and offers, at least, more praise than censure in his remarks. The one element we find wanting in his comparisons and criticism is the relation of planted and bearing area in tea to the total capital outlay—in other words the price per acre of the tea gardens in each Company's books. Seeing that the writer must have had before him our Directory, which is very freely quoted, it is a pity he did not enter on the consideration of this part of his subject; for, although it is by no means an infallible test—tea in the low-country of Ceylon, being, as a rule, far less valuable than in the higher districts—yet it is a very fair guide—*cæteris paribus*—to the position and future stablity of the Tea Companies. Next to this point, we should say that the chief defect in the writings under review, is the absence of reference to the available forest-land or other reserve owned by each Company. This again may be a very important consideration. Take, for instance, the New Dimbula Company; the fact that, besides holding 2,200 acres planted with tea on its one compact, rich, Diyagama property, this company has in the same block, very nearly 1,000 acres more of fine reserve, half of which, at least, could be put into tea if required, strengthens its exceptionally advantageous position, its tea area scarcely standing more than £40 per acre on its books. And so, with several other leading Ceylon Companies noticed, which have both a good, if not large reserve, together with a low valuation of its acreage under tea.

But now turning to the article in its several paragraphs, we may first notice that rather too much credit is given to the Ceylon Government for studying the wants of the tea industry in railways and roads. The fact is rather that the railways were sanctioned and made mainly with reference to "coffee" and "cinchona," and that "tea" has entered into the inheritance of such railway extension. Sir Arthur Gordon secured the sanction of railway extension to Haputale and to Galle so far back as March 1888; total export of tea for 1887 being under 14 million lb. All that Sir Arthur Havelock secured for "tea" between 1890 and 1895 in the shape of railways, was the extension from Galle to Matara—scarcely serving tea at all—and the short piece of line from Haputale to Bandarawela, a doubtful advantage, seeing how our late Governor dilly-dallied and bungled in the matter of the indispensable feeding roads which were to lead up to, and make the Uva railway all it might be, in the service of the Planting industry. How, again, the same ruler left the Kelani Railway line—a specially tea planting railway— need not be recapitulated.

"Out of the teeming millions in the Madras Presidency, the Ceylon tea planters obtain a plentiful supply of labour," the critic says, and truly enough, in a general way. But, nevertheless, it is a fact that our tea planters could do with a good many more coolies, and that if the time now lost—a fortnight or more per head—on the journey from village to plantation could be saved, as it best could be done by an Indo-Ceylon Railway, the advantage to the Ceylon tea industry would be very great. It is quite true, as is urged, that the area under young or newly planted tea in Ceylon is comparatively limited, by no means threatening "overproduction"; but then, in this matter our Indian brethren have more than made amends—making hay while the sun shines"—eagerly planting up *because* Ceylon planters have been holding back, so that the result is very much the same as it would be if we in Ceylon had added 50,000 more acres to our tea area during the past four or five years.

We must leave the financial comparisons made in the *Review*: here the editor stands on surer ground, especially in comparing different Companies, and we feel sure the Directors of certain Companies singled out for invidious illustration, will lay to heart the need or advantage of changing "methods," so as to secure the solidity and high credit appertaining to some of their neighbours.

It is gratifying to note the praise given to the financial and general management of the New Dimbula Company, as in a more qualified way—on one or two points—to the Ceylon and Oriental Estates Board. The Directors of the Ceylon Land and Produce Company have rather more criticism and suggestions meted out to them, though no more fault than "a lopsided way of doing business," is found; but for the Eastern Produce and Estates management of recent years there is only praise extended, while surprise is expressed at an actual reduction of working expenses between 1893 and 1895 though gross income had increased. No doubt, part of the explanation is due to the successful way in which this Company's staff do a large Agency business in Ceylon for other proprietors, so reducing the outlay on its own office account?

The development of the tea industry of Ceylon has been even faster than that of India, although the start was not made at a very rapid pace. In the year 1867 the first tea garden was planted in Ceylon with seed from Assam; but it was not until 1884 that the tea exports of Ceylon exceeded 2,000,000 lb. Since then the exports have increased at an amazing pace, so that in the eleven succeeding years their total has risen almost continuously, until the present figure of 98,000,000 lbs has been reached. There is little doubt that the island is peculiarly suited for the growth of tea, as its mild climate permits plucking almost the whole year round, and the hill slopes afford that combination of conditions which are most needed by the tea-grower. The progress of planting, too, has doubtless been rendered more rapid, from

the fact that the ruin of the coffee industry had left a number of coffee-planters and coffee-growing companies with large areas of developed land upon their hands. For these experienced planters to turn to tea-growing was an easy matter, as there were not that feeling of forests and other initial stages of development which the planters has usually to go through. Then Ceylon is a dependency by itself, and the tea-growing industry has become the most important in the island. The consequence is that its needs are studied, railways are built to serve its requirements, the coolie question is treated in a manner favourable to the companies, and in many ways the industry is assisted by the Government. This is very different treatment to that meted out to Indian growers by the Government there, which, having a a huge area to govern, naturally studies the tea-planter but slightly. A good example of the paternal manner in which the Ceylon Government watches over the leading industry, is seen in the arrangement of the export duty upon tea. The rapid increase in the outturn has for some time been a source of anxiety to Ceylon growers, and their chief aim for years past has been to widen the market for their produce. The British market, large consumer of tea as it is, could only take a certain quantity, and to extend the area of consumption meant a fair amount of expenditure of a missionary character. For some time the requisite funds were provided by a voluntary cess levied upon tea exported, but as a matter of practice this did not work well. Some growers paid the cess, while others did not, so that friction and irritation were caused. About this time the Government came to the conclusion that it would be politic to reduce the freight charges on the railways to tea-growers by about 20 per cent., and it certainly would have done this had not leading men in the industry represented that this proposal afforded an opportunity to create a fund for trade-extension purposes. Accordingly the railway rates were retained at their former figures; but the 20 per cent., or so, of the rates that would have been reduced was set aside as a fund for the spread of a wholesome knowledge of the qualities of Ceylon tea in foreign countries. This fund, in itself, did not provide enough for the purpose, so a tiny export duty of 10 cents per cwt. was levied upon all tea exported. The proceeds from this impost, combined with the share of the railway revenue, amounts to some £7,000 to £8,000 per annum; and while this is drawn from the industry in the least objectionable form, the expenditure of this money year by year has had a most favourable effect upon the consumption of Ceylon tea abroad. There is a great affinity between the teas of Ceylon and those of China, and in this respect the consumers of tea in Australasia, Canada, and the United States and Russia which represents the communities using to tea most freely outside the United Kingdom, have already commenced to take Ceylon tea rather freely. The result of these efforts is shown in the following table :—

[Exports of tea from Ceylon to various countries, already given in our columns.—ED. T. A.]

These figures show the direct exports from the island, but the quantity sent to the United Kingdom contains a fair proportion of tea which is re-exported to foreign countries. We only have the totals of such re-exports for each year, and if these be deducted from the figures for the United Kingdom, we get the following result :—

	lb. 1895.	lb. 1894.
Retained in United Kingdom ..	78,659,898	70,224,782
Re-exported from United Kingdom to foreign countries ..	7,093,441	5,123,862
Exports direct from Ceylon to foreign countries	12,186,532	9,243,070
Total exports	97,939,871	84,591,714
	1893.	1892.
Retained in United Kingdom ..	71,434,368	61,367,017
Re-exported from United Kingdom to foreign countries ..	4,065,709	3,448,058
Exports direct from Ceylon to foreign countries	8,905,987	6,338,582
Total exports	84,406,061	71,153,657

It appears, therefore, that while in the four years under review the exports of Ceylon tea increased by 26,000,000 lb. the increased quantity which came upon the British market was only 17,000,000 lb. the difference having been absorbed by the greater demand of other customers. In all the leading tea-consuming countries abroad, there is still ample room for a further absorption of Ceylon tea in place of Chinese, and at the present time the greatest attention is being turned to the United States and Canada, where it is claimed a great impression is being made in turning the public taste from China to Ceylon tea. Most of the exports to those two countries would be included in the re-exports, so that the progress shown in the direct exports to those countries only tells part of the tale. From the success attained in Australasia, America, and in Russia, those best able to judge are strong in the belief that there is no immediate chance of the tea market at home being glutted through the expansion of tea-growing in India and Ceylon.

These various considerations have all tended to encourage tea-planting in Ceylon, and, as we have said, the progress of the industry has been simply marvellous. Prior to 1889 the production of the Island was not of general importance, so that in the following table we only give the figures for 1889 and succeeding years :—

Year.		Exports.	Aver'ge price per lb.	Planted Area.	Immature Area.	Estimated number of Coolies employed.
		lbs.	d.	Acres.	Acers.	
1889	..	31,315,852	11½	205,000	135,000	220,000
1890	..	45,799,519	10¾	220,000	118,000	250,000
1891	..	67,718,372	10¾	250,000	100,000	250,000
1892	..	72,279,985	9¾	262,000	92,000	280,000
1893	..	82,269,353	9	273,000	90,000	280,000
1894	..	85,376,322	8½	288,000	83,000	290,000
1895	..	97,939,871	8¾	305,000	85,000	290,000

It will be noted that during this period the immature area—that is, the acreage of plants under five years old, and therefore not in full bearing—has steadily diminished. Consequently the increase in production must be more moderate in the future than in the past, as the new acreage coming into full bearing will steadily diminish. Indeed, the plantings of the last two or three years have been upon a very moderate scale, and there does not seem to be that danger of over-production in Ceylon which at one time was feared. The land most suitable for tea-growing has been absorbed, and what little forest land remains on the hills the Government refuses to sell, as it is needed for other purposes. Planting has commenced in the low country, and some exceedingly abundant crops have been obtained, but the quality was very low; and it is doubtful whether any extended cultivation in this direction would prove a wise investment, for the public taste in tea tends rather to improve than to deteriorate. The companies and growers, too, unlike those of India, have little reserve land, so that their operations are restricted in this respect. Still, the 85,000 acres of immature land now under plants must bring a considerable increase in the outturn for some years to come, while the more extended use of manures will easily increase the yield per acre, which is low, if the increased number of pluckings is taken into account, when compared with gardens in Assam. The growth of tea-planting in India has also to be taken into account; and the great development in that quarter certainly raises unpleasant thought as to the future. But even in case of difficulty from this cause, Ceylon, with its low initial cost of production, should be in a fair

position to meet the inevitable competition that would follow over-production. So far as experience goes, there does not seem to be any danger of exhaustion coming over the tea plants in spite of the more frequent pluckings. The Loolecondura tea garden in Kandy was the first area in the island planted with tea, this being done by Mr. Martin Leake in 1867 with seed obtained from Assam. The first produce from this garden was sold in 1871-72, and since then reports have been continuously received as to the condition of the fields which were earliest planted. These show that there is no sign of decay, and that in 1893 the 20 acres yielded 471 lb. per acre; while last year, when the trees were feeling the effect of recent pruning, the return was 382 lb. per acre.

So far as one can see, the industry seems to be a solid one, and is not likely to be demoralised by over-production, while it is claimed that tea-growing is even more profitable in Ceylon than in India. Besides the fostering care of the Government, the mere fact that Ceylon is so admirably situated at the converging point of Eastern trade, gives it a splendid position for shipping produce, for there is not the hundreds of miles of carriage upon the Brahmapootra River, with the subsequent trans-shipment and carriage across land to Calcutta, which most Indian teas have to undergo. So strongly does this freight matter influence the drift of trade, that it accounts mainly for the fact that all the tea drunk in the Bombay Presidency comes from Ceylon, its conveyance costing so little compared with transit from Calcutta. Then a more important advantage even than cheap carriage and freight is the lightness of the charge for labour. Celyon is almost attached to the southern point of the Indian peninsula, and out of the teeming millions in the Madras Presidency the Ceylon tea-planters obtain a plentiful supply of labour. There is no question of sending sirdars and paying costly premiums in order to obtain labourers. The only inducement offered is that sometimes the cost of travel will be advanced to them, but in this case it is treated as an advance, and is afterwards deducted from the monthly wage. As a consequence, the wage of the Ceylon labourer, which was always lower than that of the Indian tea coolie, has remained the same, while the Indian planter has gradually seen the premium for his coolies rise until it amounts to a sum that virtually doubles the wage of the old days. This rise in the Indian cost of labour has been little noticed, but it goes far to neutralise the much-talked-about benefit from the depreciation of the rupee. Speaking generally, it may be said that it costs about 4d. to 5d. per lb. to produce Ceylon tea by the larger companies which are at work in that island, while the still larger undertakings in Assam find that 6d. to 8d. per lb. is nearer the figure. The Ceylon grower, however, does not obtain the full advantage of this difference, as the average price of Ceylon teas is about 1d. to 1½d. lower than that of India.

Turning now to the companies which work in the island, it should be at once stated that far less is known about them than about those of India. The usual form they take is small plantations of perhaps under 1500 acres, worked by people in practically a private manner. Those companies, too, that do publish reports accessible to the public are very chary of furnishing information. Few, indeed, give the actual amount of tea turned out, while not one furnishes the interesting table of cost of production, and other details which are to be found in the reports of the Indian companies represented by Mr. Earnshaw. There is, therefore, less basis for analysis in their case, and more dependence upon the rule-of-thumb measurement obtained through mere statements of net profits and dividends paid in the past. With this view we have studied the recent reports of a number of the companies, and find that the companies are usually small, and that considerable use of debentures has been made in obtaining money for their development. At the same time there appears to be a due regard for reserves, while many of the companies have redeemed a proportion of their debentures out of revenue. The following table gives the capital and other details of the balance sheets of some of the leading companies:—

Companies.	Ordinary Capital paid up. £	Preference Capital paid up. £	Debentures and Loans. £	Reserve Fund. £	Investments £	Last Divid. on Ordiny. %
Bandarapola ..	15,100	..	9,000	..	..	6
Ceylon and Oriental Estates..	55,264	46,320	65,000	..	..	8
Ceylon Land and Produce ..	47,950	26,450	33,790	2,000	..	20
Ceylon Tea Plantations ..	167,380	81,080	..	70,000	71,106	15
Eastern Produce and Estates ..	298,250	753	122,500	15,000	23,171	5
Kelani Association	16,265	..	12,900	3,000	3,000	17½
Nahalma Estate.	14,000	..	10,000	1,267	..	8
New Dimbula ..	86,200	..	..	3,000	..	10
Panawal ..	17,000	5,300	800	230	230	10
Scottish Ceylon	41,000	9,000	..	6,000	4,992	15
Scottish Trust and Loan ..	45,000	..	12,550	10,000	..	10
Standard Tea ..	56,000	..	7,000	7,500	..	15
Sunnygama ..	50,000	5,000	10,000	..	..	10

Those companies which show small reserves are usually of recent formation; but it does not say much for their Boards that they pay such high dividends and set aside little or nothing for a windy day. On the other hand, there are some striking examples amongst them of prudence and foresight, and the desire on the part of the well-managed concerns to write down their assets, and so place them in a strong position, was never better exhibited than in the reports just issued. Last year was a distinctly favourable one for Ceylon tea-growers, and the opportunity was therefore taken by the better-managed companies to lay by for the future. To show what this means, we have drawn up the next set of figures, which gives the profit earned by each company after paying working charges, office and directorial fees, debenture interest, etc., and the manner in which this profit has been distributed. As the reports differ in their rendering of the accounts, this task has proved a more difficult one than appears at first sight, but we have endeavoured to make the comparison as complete as possible.

DISTRIBUTION OF NET PROFITS.

Companies.	Profit before deduction of depreciation. £	Depreciation written off. £	Debentures redeemed, amounts placed to Reserve, etc £	Preference interest. £	Dividend on ordinary £	Increase or Decrease on amount carried forward. £
Bandarapola	851	..	..	..	883	- 32
Ceylon and Oriental Es-Estates..	9,464	500	3,500	1,191	4,421	- 148
Ceylon Land and Produce ..	8,836	..	2,000	1,587	4,300	× 949
Ceylon Tea Plantations	51,927	2,000	19,291	5,486	25,107	× 14
Eastern Produce and Estates...	44,221	4,301	15,189	37	14,956	+9,727
Kelani Tea Association	5,063	678	2,000	..	2,846	- 459
Nahalma Estate ..	1,696	..	793	..	1,120	- 217
New Dimbula ..	17,482	1,750	3,000	..	12,806	- 74
Panawal Tea	2,833	..	796	371	1,700	- 34
Scottish Ceylon ..	8,801	838	1,000	630	6,150	× 183
Scottish Trust and Loan ..	9,206	2,247	379	..	4,500	×2,081
Standard Tea ..	12,296	1,500	2,500	..	8,400	- 103
Sunnygama.	5,868	240	179	150	5,000	+ 298

A brief study of this table soon enables one to distinguish between the two classes of Boards. A glance at the amount spent on ordinary dividend, and its relation to the profit obtained, generally settles the matter. And it is an astonishing fact that if one looks back to the preceding table it will be found to be precisely those Companies which possess the best reserves that still continue to add thereto. Companies like the Panawal, Bandarapola, and Sunnygama may pay high dividends, but they will never reach the solidity of the Ceylon Tea Plantations or the Standard Tea Company unless they change their methods. To pay dividends is, of course, good, but to pay dividends and provide for the contingencies of the future is far better. And in this respect we should like to point out a rather unique feature amongst Ceylon Tea Companies. Our tables contain the names of the Ceylon and Oriental Estates, Eastern Produce and Estates, New Dimbula, and Scottish Trust and Loan Companies which represent the revivification of a group of coffee and cinchona growing companies. When coffee and cinchona growing were ruined in Ceylon, these companies fell into difficulties, and only by resort to tea-growing have they got into a better financial condition. The change from one class of produce to another was costly, and took a long time, so that for years the majority of these companies paid little or no dividends, any profits that were obtained being required for interest upon and redemption of debentures, or to pay cumulative interest upon Preference Shares. Patient work in this direction has at last effected its object, and all of these companies have, within the last year or two, worked their way into a financial position of ease. To demonstrate their methods all the more clearly, we give a *résumé* of the working of four companies of this type in the Company Notes included in this number. Now that these old companies have cast off the burden of former troubles, their revenue will be all the more available for dividend-paying purposes, and consequently their shares offer a fair medium for investment, especially as they often stand at moderate prices. As will be seen in the following table, the yield in their cases, under present conditions, is not high; but without taking too sanguine a view, it may easily be assumed that dividends in the future will certainly be higher, unless the Ceylon tea industry suffers one of those calamities which now and then befall a planting industry. Of such an event there is, however, no sign at present. We append a table of dividends for the past five years, with the price of the shares, and the return on an investment based upon the distribution for the last twelve months' working of each Company :—

Companies.	Dividends. 1891.	1892.	1893.	1894.	1895.	Amount Paid per Share.	Price June 15th.	Yield based upon last Yearly Dividend.		
	%	%	%	%	%	£	£	£	s.	d.
Bandarapola	..	..	6	10	6	10	11	4	5	8
Ceylon and Oriental Estates	..	4	30	5	8	5	7	5	4	0
Ceylon Land and Produce	10	15	20	15	20	5	14	7	2	10
Ceylon Tea Plantations	15	15	15	15	15	10	30	5	0	0
Eastern Produce and Estates	1½	2¼	3	3	5	5	6¼	4	1	7
Kelani Association	20	15	15	15	17½	10	25	6	0	0
Nahalma Estate	..	..	8	8	8	1	1¼	6	8	0
New Dimbula A	8	8	8	8	10	10	21	4	15	3
New Dimbula B	6	12	11	22	18	10	22	9	0	0
Panawal	..	6	8	8	10	10	14½	6	17	7
Scottish Ceylon	15	15	18	15	15	10	24	6	5	0
Scottish Trust and Loan	10	10	10	5	10	3	4	7	10	0
Standard Tea	10	10	10	12½	15	10	26	5	15	0

THE NEW DIMBULA COMPANY.—Originally a coffee and cinchona growing concern, this Company was forced to resort to tea-planting, and after a hard struggle seems to have reached smoother water. Fortunately it had no debentures, or it is hard to say what fate would have befallen it; but the cumulative dividend upon the "B" Shares at one time was as much as £22,284 in arrears. Five years ago some efforts were made to revive the coffee and cinchona business, but matters went from bad to worse, so that the cinchona trees have died off, while all hope of revenue from coffee has been given up. The Company has therefore become a tea-planting concern pure and simple, and seems to have pretty well attained its full development. Of the total area of 2193 acres planted with tea, 1921 acres were in full bearing last season, and the remaining 272 acres come to maturity in 1895-96. The change from one form of industry to another naturally led to some outlay, and this was provided out of revenue. Two accounts—the factory and machinery and the tea extension accounts—were established, and these, during the period of earlier planting, increased, although deductions were made from revenue each year; but as the planted acreage came more and more into bearing, the deductions from revenue became larger, and last year both accounts were extinguished. During the past five years the amounts written off revenue were £5,069 for "tea extension," and £8,531 for factory and machinery. At the same time, the increasing profits permitted the paying off of the dividend arrears upon the "B" Shares, and the whole £22,284 due upon those shares has been wiped out. The record of the Company in these five years is given in the following table:—

Year ending June 30th.	Revenue.	Working Expenses	Written off Tea Extension.	Written off Factory & Machinery	Nett Profit.	Arrears of Dividend on "B" Shares
	£	£	£	£	£	£
1891	19,869	12,067	1,000	1,900	4,901	21,169
'92	24,641	11,657	2,000	2,157	8,824	22,218
'93	24,410	11,851	1,500	1,224	9,834	20,055
'94	29,932	12,129	500	1,500	15,802	14,484
'95	29,842	11,490	69	1,750	15,731	6,685

In addition to finally wiping out the factory and tea extension accounts, last year a reserve fund was commenced with the setting aside of £3000. If the price of tea does not fall, and the rupee exchange keeps steady, the Company should see some further increase in its profits, but no new planting seems to be in progress. Its financial position is an easy one, for the last balance-sheet showed £18,552 of cash, and £6875 of produce in hand, with creditors to the amount of only £8515. The share capital paid up is £22,080 of "A" Shares, £55,710 of "B" Shares, and £8110 of "C" Shares. The "A" and "B" Shares receive 8 per cent dividend before the "C" obtain anything, the distributions upon the "B" being cumulative. After the "A" and "B" have received 8 per cent the "C" receives 6 per cent and then an additional distribution is made at the same rate upon each class of shares, so that when profits are good the "C" Shares will always receive 2 per cent less than the others. Last year, although 8 per cent of arrears had to be paid off the "B" Shares, the Company distributed an additional dividend of 2 per cent upon the whole capital, so that the "A" Shares received 10 per cent the "B" 18 per cent (including the 8 per cent of arrears), and the "C" . per cent. Now that the old legacies are written off, and supposing profits for this year were equal to those of last, it would be possible for the Company to pay 12 per cent on the "A" and "B" Shares, and 10 per cent on the "C" Shares, and then place £5000 to reserve, which fund, by the bye, ought to be invested outside the business.

The Ceylon and Oriental Estates Company.—This is the successor of the Investment Corporation, and the reorganisation, which was effected in 1892, left traces of the old troubles in the balance-sheet. With £63,229 of paid-up capital, there were no less than £100,000 of six per cent Debentures out, which debentures had been issued at £15,000 discount. The expenses of the reorganisation were £3,509, while a deposit of £3556 with the New Oriental Bank had been locked up by the failure of that institution. Meantime heavy expenditure had to be faced in the way of outlay upon new buildings, machinery, and extension of tea, coffee, and cocoa cultivation. The estates held formed one of the most extensive areas, under single control in Ceylon being 11,378 acres of which 4,309 was under tea, and about 2,000 acres under coffee and cocoa, much of the tea being immature. The Board, however, has steadily pursued a course of paying moderate dividends and writing down the unsatisfactory assets, while each year £3,500 of debentures have been redeemed. By dint of this, the debentures in the last balance sheet were reduced to £89,500, the debenture issue expenses, &c. account has fallen to £6,500, and the Oriental Bank deposit account stands at £716. The progress of the Company in this respect is shown in the following table :—

Year ending Dec. 30th.	Revenue.	Working Expenses and Debenture Interest.	Nett Profit.	Written off Debenture Expenses, etc.	Debenture Issues and Expenses Account.	Debentures.	Dividend
	£	£	£	£	£	£	%
1892..	36,576	31,453	5,122	4,378	15,770	100,000	4
1893..	36,631	32,622	4,196	1,740	13,542	96,000	3
1894..	39,645	31,654	7,668	4,042	10,000	93,000	5
1895..	44,160	34,697	9,342	4,000	6,500	89,500	8

It is not clear from the reports whether the redemption of the debentures was effected out of profits or not, as there was an increase of £27,000 in the share capital, chiefly Preference Shares; but some £20,000, was expended upon new extensions, buildings, and machinery, while sales and purchases of estates have led to a nett increase of 710 acres to the area of land held. Out of the 12,089 acres now owned, 5,714 are under cultivation, 5,085 of these under tea. Some 650 acres of this last total have yet to come into bearing, and a fair share of the portion now being cropped is immature, and should give increased returns in the futue. The reduction in the debenture issues enabled the directors to reorganise the capital of the Company this year, and by issuing more Preference Shares it has been possible to still further reduce the amount of debentures, and, at the same time, lower their rate of interest from 6 to 4½ per cent. Under this arrangement the debenture issue will amount to £65,000, the Preference Shares to £46,320, and the Ordinary Shares to £55,264. The debenture stock is irredeemable for ten years. This arrangement will reduce the charges upon revenue considerably, and, at the same time, profits ought to show improvement, owing to the large acreage still under mature plants. It should not be forgotten, however, that the Company has no reserve, while the £20,000 spent upon buildings, machinery, and extensions would have been written off out of revenue by a stronger company, instead of being placed to capital. Accordingly, it will be prudent to increase the amount for depreciation each year, so as to bring the valuation of the block account back to a normal condition. No doubt, however, the Board, which must have a keen remembrance of management under poverty-stricken conditions, will see that this necessary task is undertaken. Even then, a moderate increase in dividends seems possible, if events continue to favour the Ceylon tea industry.

The Ceylon Land and Produce Company.—This Company was formed in 1885 when the old Oriental Bank had its first misfortune. Ceylon properties at that time were not favourably looked upon, and no doubt the purchase was effected at a moderate price. A mistake, however, was made in purchasing and developing cocoa-growing properties, but latterly the Company has turned the major part of its attention to tea. Dividends were small and uncertain for some years, but 10 per cent was paid for 1890 and 1891. An exceptionally good profit in the latter year enabled the Board to take in hand the writing down of the cocoa properties. By that time they had recognised that these were not worth the money they had paid for them, and, like wise men, they proceeded to write £8038 off the book value of the estates out of profits. Not content with that they have further paid off a mortgage of £15,000 out of revenue. This was completed in 1895. These necessary deductions have been a considerable drain upon profits, so that special allocations for the depreciation of buildings and machinery have ceased. The dividend for 1892 also had to be reduced to 7½ per cent, but since then 20 per cent has been paid for 1893, 15 per cent for 1894, and 20 per cent for 1895. The profits of last year were free from any deductions to repay the mortgages, and the Board took the opportunity to commence a reserve fund with a sum of £2,000. It would be judicious, however, to return to the custom of writing off a stated sum each year for the depreciation of buildings and machinery, and this measure would be rendered more instructive if it were accompanied by a division in the balance-sheet of the value of the buildings and machinery from that of estates and nurseries. The Company's progress during the past six years is set forth in the following table :—

Year ending June 30.	Revenue.	Working Expenses,	Interest on Debs and Loans.	Depreciation, etc., written off.	Nett Profit.	Amount of Mort. and Debs.	Dividend.
	£	£	£	£	£	£	%
1890	29,380	19.925	3,201	555	5,697	42,997	10
1891	41, 25	21,012	2,811	9,233	3,069	39,327	10
1892	33,847	23,215	2,451	4,513	6,119	39,672	7½
1893	38,890	23,587	2,518	1,592	11,192	36,247	20
1894	28,771	21,332	2,194	1,039	4,196	30,810	15
1895	35,838	24,735	2,202	2,063*	8,836	28,760	20

* Includes £2,000 set aside to commence a reserve fund.

The reduction in the interest paid upon debentures is partly the result of a reduced rate. Tea forms the staple resource of the Company, 1555 acres being under bearing; while 286 acres of young tea are in process of development. Some 1553 acres are also under cocoa and coffee, but the revenue from this source is not relied upon for dividends. It is calculated that the properties have been written down £20,000 by deductions from revenue in the last six years, and it is probable that less will be devoted to this matter in the future. The reserve ought, however, to be further increased, and this should give the Company the opportunity to improve its financial methods. At present, in common with many other Ceylon companies, its practice is to bring the value of produce in course of realisation and unsold into the profit and loss account and treat it as revenue. Like "accrued" interest taken as revenue by a trust company, it is a device which opens the way to abuse, and should be discontinued by strong companies. As corollary to this, we find that deposits, sundry creditors, bills payable, and balances due to superintendents in Ceylon, totalled over £28,000 in the last balance-sheet; while cash, debtors, and advances came to only £8,200. This is rather a lopsided way of doing business and when revenue is anticipated up to the hilt, an unforeseen contingency might prove awkward. A stronger reserve should provide funds to remove this danger, and the Board having acted so vigorously before, will doubtless treat this matter with becoming energy.

The Eastern Produce and Estates Company.—Apparently this Company succeeded to a poor heritage when it took over the properties and estates of the old coffee-growing concern known as the

Ceylon Company. The debenture issues amounted to £195,200, and the interest upon them at 6 per cent in 1890—the first year of the new Company's working—exceeded the nett balance left after its payment. A large area of the estates had then been planted with tea, half of which was immature, and as this gradually came into full bearing the revenue of the Company improved to a moderate extent. The greatest gain to the Company, however, has been from the prudent financial policy adopted by the Board. Seeing that the debentures were a heavy drag, they devoted all their efforts to reduce the total. Each year a certain sum was set aside from revenue, and realisations of a part of the estates also took place each year for a time. So far did this determination to reduce the charges go, that it was set down in the articles of association that no dividend above 3 per cent should be paid upon the shares until the debentures had been reduced to £50,000. This clause, excellent in motive, proved in practice rather Quixotic, and has been since rescinded. The realisations of property in the past five years amounted to £68,500, and, together with the sums spent out of profits, enabled the debentures to be reduced to £122,500. A great improvement took place last year when the outstanding Six per Cents were replaced by a Four-and-a-Half per Cent issue, which will be paid off by annual redemptions of £7,500. The working of the Company in the past six years is shown in the following table :—

Year ending Dec. 31.	Revenue.	Working Expenses.	Debenture Interest.	Nett Profit.	Debentures Redeemed, Depreciation and other Sums written off Revenue.	Amount of Debentures.	Dividend.
	£	£	£	£	£	£	%
1890 ..	93,879	71,756	11,712	10,410	6.677	195.200	nil
1891 ..	83,449	71,412	11,393	15,215	6,156	185,190	1½
1892 ..	86,206	64,903	10,903	11,090	7,187	175,410	2¼
1893 ..	102,124	71,716	10,361	20,045	8,719	170,880	3
1894 ..	100,923	64,569	9,920	26,466	7,837	149,880	3
1895 ..	116,429	68,940	7,577	40,365	19,115	122,500	5

The chief factors in the wonderful fourfold multiplying of the nett profits in the period have been the reduction of the interest upon debentures and the economical working of the estates. Thus, while the outturn of tea doubled in the time, and gross revenue rose by about 28 per cent., the working expenses actually diminished by nearly £3000. This may be partly accounted for by the sales of portions of the estates, as doubtless the least remunerative properties would be disposed of. The sums spent on tea extensions and machinery and buildings have been carried to capital, but heavy reductions took place each year in the latter item on account of depreciation, so that, with considerable additions each year, the item of machinery and buildings stood on the last balance-sheet at £7221, as against £9938 in 1890. Doubtless this item will be written off entirely in a year or two. The tea extension account is mixed up with the sums spent on fresh land purchased, and this combined asset figured last December for £44,601, as compared with £26,419 in 1890. It would be wise policy to divide up the item, and then the expenditure upon tea extension could be written down, if the practice of strong tea companies is to be followed. The reserve of the Company now amounts to £15,000 and it holds £23,171 of investments, about the composition of which it would be interesting to have a little information. The recent reduction in the interest upon debentures will further diminish the annual charge by about £2,000, and the cash balances are very good. So careful is the Board of this Company about the chances of the future, that out of its nett profit last year of £40,365, only £14,944 was distributed in the dividend of 5 per cent. Of the balance of £25,421, some £10,189 was taken to pay off debentures and meet the expense of issuing new debentures, £5,000 was placed to reserve, and £10,182 carried forward as a provision for retirement of debentures in the current year. The area owned by the Company is one of the largest under one management in Ceylon, and as the Company furnishes more information than Ceylon companies usually do as to the yield and price obtained for its tea, we are able to give the following table :—

Year.	Total Area.	Under Tea.	Tea over Four Years old.	Yield.	Average Gross Sale Price per lb.
	Acres.	Acres.	Acres.	lb.	d.
1890..	17,764	9,266	5,400	1,518,000	11½
1891..	16,791	9,236	6 700	2,008,000	9¾
1892..	16,756	9,552	8,000	2,020,780	9½
1893..	17,273	9,750	8,740	2,638,000	8½
1894..	17,323	10,048	8,970	2,742,000	8½
1895..	16,630	10,347	9,192	3,276,009	7⅞

There is thus a fair quantity of plantings to come into bearing, and as maturity is not reached until after the sixth year of planting, the outturn of tea should increase considerably in the next few years if seasons continue favourable. The price, however has fallen rather sharply, so that the larger output may not mean very much increased profit. But without this the Company ought to be in a position to distribute larger dividends at no distant date.

METROPOLITAN NOTES.

London, July 2.

The following are from a London daily's "City article":—

Important Companies.

The British North Borneo Company.

While the Chartered Company of British South Africa has been forcing the pace and attracting the attention of almost every man, woman, and child in the United Kingdom (we know many enthusiasts who bought shares in the names of their children, and who paid £7 or £8 for them), the Chartered Company of British North Borneo has fallen out of notice to such an extent that the transfer fees for the whole of 1895 amounted to £18 12s 6d, showing that only 149 deeds were lodged during twelve months, or barely more than ten each Stock Exchange Settlement.

In presenting their reports and balance-sheet from 1st January to 31st December, 1895, the directors of the British North Borneo Company have but a modest tale to tell. The total receipts on revenue account amount to £40,240, while the expenditure reaches £33,260 in Borneo and £4,300 in London. Needless to say, no dividend is declared upon the called-up capital of £497,000.

We are inclined to think, however, that the Borneo Company has a future before it, and that the steady and withal quiet management of the country promises good results later on. British North Borneo consists of some 30,000 acres of land, so is slightly larger in extent than the Crown Colony of Ceylon, which lies in more or less the same latitude, and grows more or less the same tropical products.

During the early days of Ceylon, or, indeed, during the two centuries when the island nominally belonged to the Portuguese and the Dutch, the jungle-clad hills of the Central Province were untouched, and even unexplored. Yet now the greater part of the revenue is derived from the Central Province. In Borneo the coast lands have alone been made use of, and the planters of tea, coffee, and cocoa have yet to be attracted.

The directors are to be commended for the full table which they give of the imports and exports of the years 1894 and 1895. From the subjoined examples a good deal can be gleaned of the actual development of the country, the figures speaking for themselves, and requiring no comment :—

Exports.	1895.	1894.
Camphor ..	$33,900	25,300
Coffee ..	14,800	1,500
Cutch ..	114,000	96,000
Gutta ..	46,800	30,700
India Rubber ..	49,000	35,300
Sago flour ..	121.300	122,000
Tobacco ..	1,176,000	875,000

For 1894 the total exports amounted to $1,698,000; for 1895 they reach a total of $2,130,000.

In the House of Commons, there has been a discussion on

"COCOA BUTTER,"

(not to be confounded with "coconut butter," of which we have also heard). This is most fully reported in the *Morning Post* as follows:—

COCOA BUTTER.

The House then went into Committee of Ways and Means, Mr. J. W. Lowther in the chair.

The Chancellor of the Exchequer moved the following resolution:—"That the duty of Customs now payable on cocoa or chocolate ground, prepared, or in any way manufactured, under the provisions of the Act 42 and 43 Vic., cap. 21, sec. 3, shall be payable on that product of the cocoa bean which is generally known as cocoa butter." The right hon. gentleman said the matter was a very small one, and could be easily explained. At the present moment cocoa, raw or manufactured, was liable to duty, and it had been discovered that cocoa butter, though manufactured from cocoa, could not properly be included as a manufactured article because the process of manufacture had not come within the scope of existing provisions. This article was largely used in the manufacture of chocolate. Out of every hundredweight of raw cocoa 86lb. of cocoa butter was manufactured. As the law stood the manufacturers of cocoa butter in this country were liable to a duty of 11-3d on every pound of cocoa butter, whereas the manufacturer abroad could send the article over here without paying any duty. This was protection for the foreigner against the Englishman—(hear, hear)—and therefore he asked that the Committee would pass this resolution.

Mr. Kearley protested that no notice had been sent to the great manufacturing firms of the country.

The Chancellor of the Exchequer said he had received communications from Messrs. Cadbury, Taylor, Epps, Lipton, and Thorn, all of whom desired this alteration in the law. (Cheers.)

Mr. Kearley noticed one serious omission in that list, and that was a firm which flourished in the district represented by the right hon. gentleman, namely, Messrs. Fry, of Bristol. He understood that they strongly objected to this, and appeared to be quite in ignorance of it.

The Chancellor of the Exchequer said he had received a communication from Messrs. Fry, who, he thought, had not understood the purport of the resolution.

Mr. Kearley asked that the resolution should be postponed for at least a week in order that Messrs. Fry and other firms should be able to obtain a hearing. He maintained that if a duty were imposed on cocoa-butter the foreign trade of certain manufacturers would pass away.

The Chancellor of the Exchequer pointed out that a clause embodying the views of those on whose behalf the hon. member spoke could be placed on the paper and discussed on the Finance Bill. That would give ample time for the matter to be fully considered in the interval by the manufacturers and others interested. (Hear, hear.)

Sir W. Harcourt observed that this was purely a preliminary stage, and he advised his hon. friend to be satisfied with the assurance of the Chancellor of the Exchequer.

The resolution was agreed to, and the House resumed. But *The Times* gives some additional figures; for instance, mentioning that apart from English firms paying duty on the raw product to make this butter, Dutch and German houses that paid less duty on the beans actually got a drawback on the "butter" they exported to England!

MR. ERNEST E. GREEN

writes to me on 1st July as follows, and it is as well his note should be published to prevent any misconception:—

"I have been much gratified by the way the district associations have been coming forward in support of my book on the Coccidæ of Ceylon; but, judging by remarks made in the course of the discussion at the meetings, I fear that there is some misconception as to the scope of the work in question. There seems to be an impression that the term 'Coccidæ' is synonymous with 'insect pests.' This is not so. The family Coccidæ covers only one group—namely, the 'scale bugs'; and although the greater number of our pests *do* belong to this family, there are others—and important ones—that do not. 'Helopeltis' is one of the exceptions, as I have previously explained you. I shall be much obliged if you will mention this in writing to Ceylon. As I should be very sorry to take advantage of such a misconception and cause disappointment, I hope that anyone who has been led to subscribe solely under the wrong impression will withdraw his subscription."

For my part, I cannot see how there can be any disappointment, for Mr. Green's book is sure to be very useful.

LONDON, July 10.

MR. J. L. SHAND

is back from his mission to Central America—Costa Rica—chiefly to report on valuable coffee property in a new district of that rising coffee state, which the owner wishes to develop by means of English capital and probably a Limited Company. I have not seen Mr. Shand yet, but learn his Report is favourable. In this connection it is of interest to read what is said about "coffee" in the adjacent state of Columbia (South America) in the course of a recent Consular Report quoted by *Commerce*:—

COLOMBIAN COFFEE.

Colombia possesses a large expanse of territory, with the favourable (or unfavourable) circumstance that, though geographically situate in the tropics, the climate is diversified in all grades, from that of everlasting snow that covers many summits of the Andes, down to continual heat and burning sunshine. The country, says Mr. Consul Mallet, may be said to be practically uninhabited. The whole number of inhabitants is supposed to be 4,000,000 souls, but as no census has ever been taken, any idea as to the number of inhabitants must necessarily be speculative. The whole country is divided into departments, and each department is subject to the Central Government which has its seat in Bogotá. The machinery of the Government is managed entirely in that city.

The chief agricultural product is coffee. The belt of land lying about 3,000 feet above the level of the sea is where the greater part of this berry is produced, though the part grown at 4,000 feet elevation is of a quality superior to that grown further down. Were there sufficient population, there is no reason why the annual crop should not be much increased. It seems easy enough to remedy this want by merely promoting immigration from other lands, but there are many practical difficulties in the matter. The first difficulty is to get together a certain number of people suitable for the work. When got they have to be brought over to these burning shores; after arriving they have to be conducted up rivers, and over primitive roads until they arrive at the section of the country to which they have been destined. Next comes the housing, clothing, and feeding of them, and all the care that must be taken of their health; next the building of the village where they and their families are to dwell. Add to all these the isolated position in which these immigrants find themselves among people of different race, language, religion, and customs, and it is easy to understand the causes of utter failure and individual suffering in so many immigration schemes.

As a general rule Colombians do not migrate through their country. The warm country man rarely goes to the temperate zone, and those of the latter seldom descend to the warm climates. Thus the coffee growers depend entirely on their own hands, and the result is that no more coffee can be cultivated and harvested than what the actual inhabitants of those regions can accomplish. At present the departments in which the cultivation of coffee is carried on are as follows:—Santander, Antioquia, Tolima, and Cundinamarca. In consequence, however, of the scarcity of labourers, comparatively few large coffee estates are carried on. The very great proportion of the yearly crop is produced on small holdings, which are worked by the holder and his family.

Last night we had the following:—

"COCOA BUTTER.

"The CHANCELLOR OF THE EXCHEQUER moved a new clause imposing a duty of 1d per pound on cocoa butter.

"Mr. T. LOUGH contended that the principle of the tax was wrong. This was a subtle attack upon the whole policy of free trade, (Hear, hear.)

"The clause was added to the Bill."

At length our old friend

"RHEA"

seems to have fallen into energetic hands and Capt. Whitley's Company is looking up: here is its advertisement in financial papers:—

"RHEA FIBRE TREATMENT.

The owners of the Gomess Patents and Rights for the following countries are prepared to receive applications from foreign and colonial companies or financial houses for dealing with such of these Patents and Rights as remain unsold, either in the form of working under licence or purchase outright.

*Austria	Fiji	Portugal
Argentine Republic	Finland	Portuguese Colonies
Barbadoes	*Germany	Queensland
*Bulgaria	Guatemala	*Russia
*Belgium	Greece	*Roumania
Brazil	Hawaii	Spain
British Guiana	Holland	*South Africa
British Honduras	Hong Kong	South America
Bahamas	*Hungary	*Straits Settlements
Bolivia	*India	South Australia
Buenos Ayres	Italy	Sweden
Burma	Jamaica	*Servia
British Co'umbia	Japan	Switzerland
Borneo	Leeward Islands	Tasmania
*Ceylon	Luxembourg	*Transvaal
Canada	Mauritius	Trinidad
*Cape of Good Hope	Mexico	Tunis
Congo Free State	Madagascar	*Turkey
China	Newfoundland	*United States of America
Chili	New Zealand	Venezuela
Cuba	Norway	Victoria
Denmark	New South Wales	West Australia
*France	*Natal	
	Orange Free State	
	Peru	

"The Patents and Rights for countries marked * in the above list are either already sold or negotiations are proceeding with respect to them.

"Applications to be made as below, where information can be obtained and samples seen.

"The Foreign and Colonial Rhea Fibre Treatment Syndicate, Limited.

"17, Shaftesbury-Avenue, London, W."

And two London evening papers discuss the subject as follows:—

"A RHEA FACTORY FOR LANCASHIRE.

Our old friend rhea has turned up once again, this time in Lancashire. It is to be manufactured by a company which has taken over the Castleton Mills, Rochdale, for the express purpose. The process, which will be employed, is that known as the Gomess process. Lancashire spinners appear to be taking favourably to the new fibres which have been recently exploited or perfected. More than one mill in the vicinity of Manchester is occupied with the preparation and production of the particular fibre, and from all we hear they cannot turn out enough yarn to meet the demand. Moreover, we hear of other companies projected in addition to the one just formed at Rochdale. The capital for this venture, by the way, has all been subscribed privately. There is certainly a big demand for the commodity, and it looks as though it may have come to stay at last."

MORE ABOUT RHEA.

How far rhea fibre is likely to realise all the great things that its admirers have prophesied for it is open to question. But evidently there is no intention of allowing financial enterprise in that direction to be confined to the flotation of the large Rhea Fibre Company that was offered to the public some months ago. A company has just been registered to acquire a private concern hitherto known as the Rhea Fibre Treatment Company, Limited, and the name of the new enterprise is the Rochdale Rhea Fibre Spinning Company, Limited. The capital is £75,000 in 25,000 preferred and 50,000 ordinary shares. Another interesting registration at Somerset House is that of James Nisbet & Co., which has been formed to take over the well-known publishing business in Berners-street. It is gratifying to see that the directors' qualification is fixed at £1,200. It is not often that directors are forced to take so sensible and substantial an interest in a Company from which they drew their fees.

PLANTING AND PRODUCE.

TALK ABOUT THE TEA DUTY.—The discussion in Parliament on the tea duty, a report of which appears elsewhere, although it came to nothing from a practical point of view, gave the question airing, and brought out a few points in connection with Mr. Chamberlain's Zollverein scheme and its application to British grown tea. In discussing the Finance Bill, Mr. Lloyd-George on the last occasion had moved an amendment to exempt tea grown in any part of Her Majesty's dominions from the tea duty. Since this amendment was moved Mr. Chamberlain has propounded his scheme for an Imperial Zollverein. The amendment gave an excellent opportunity for discussing it. The Radicals, in the interest of progress, were willing to forego the chance, but Mr. Lowther—the champion Protectionist—would not let it slip. He has been organising Protectionist meetings up and down the country, and was back in the House full of encouragement and enthusiasm. There were many demands for the "author," but Mr. Chamberlain carefully kept out of the House, although he was on the premises. On the withdrawal of Mr. Lloyd-George's amendment, Mr. Lough moved that Ireland should be exempted from the payment of the tea duty, a suggestion which, as the Chancellor of the Exchequer pointed out, would involve the restoration of custom houses between Great Britain and Ireland and a reversal of our settled policy of fiscal unity. This amendment was withdrawn, and then Mr. H. Lewis moved an amendment to the effect that the duties on higher-priced teas should be raised and the duties upon lower-priced teas lowered. This also was withdrawn. Mr. Lloyd-George moved to reduce the tea duty from fourpence to twopence per pound, but the proposal was defeated by 263 votes to 96, and the clause was agreed to by 228 votes to 87. During the discussion Mr. Labouchere was afforded an opportunity of saying that it gave him great pleasure to vote in favour of a reduction of the tea duties, and Mr. Lough, who is in the tea trade, was permitted to express a trade view on the question of duty as it affects the price of tea. The funniest thing in the debate came from that mad wag, Mr. T. G. Bowles, who delivering himself on the accident wheeze about the terrible effects of tea drinking in Ireland, mentioned in his playful way that "the more tea was drunk in Ireland the more the Irish population diminished." The debate on the whole was conducted in a rollicking spirit, and was not at all a bad advertisement for the tea trade. As for the rights and wrongs of the tea duty, all the advocates of a "free breakfast table" protested against the maintenance of this tax in a year of an overflowing Exchequer, and an unprecedented surplus. That the money raised by a 50 per cent tax on the poor widow's cup of tea had been squan-

dered in "bloated armaments" and doles to rich landowners gave the Radicals an excellent text, and they did not fail to improve upon it.

NEW INDIAN TEA COMPANY.—The Oodmarie Tea Company, Limited, Assam, has been formed with a capital of £40,000 for the purpose of acquiring as from January 1, 1896, and working as one concern, the three tea estates known as Oodmarie, Balijuri, and Lung Soong, situate in the district of Nowgong and province of Assam, India, together with all buildings, machinery, stock, coolies under contract, &c.

GROCERS AND PACKET TEAS.—Some correspondents have recently called attention to the evils, from the grocer's point of view, of the packet tea trade. But the *Grocer* gives its readers some advice on the subject, which they must of necessity ponder on. It says: "There will be agents, and there will be packet teas: query, is it practicable for a grocer to refuse to sell all such goods? However desirable the own-blend system may be, you do not get rid of a danger by ignoring it. The feature of these packet teas is that they are so easily handled that no special skill is required in those who sell them. If grocers generally refused to sell them, the wholesale merchants would easily enough obtain the services of confectioners, chemists, or even perhaps tobacconists (who have already somewhat too much experience of packet goods for their comfort) as their agents, and although nobody else could be half so efficient in that capacity as the grocer, the latter would probably lose a little of his trade, and see other people gradually extending their encroachments upon it. Quite so!

COFFEE DRUNKENNESS.—Medical men are delightfully impartial in their attacks on tea and coffee drinking. When they have finished for a time the operation of jumping on tea drinkers, they give the coffee imbiber a turn. There is an outcry in America and on the European continent against coffee drunkenness, which is said to be one of the latest dangers. A New York doctor, who has made a special study of the subject, says his observation has shown beyond question that chronic coffee poisoning is much more common than is generally supposed. "The symptoms are usually confounded with alcoholic disturbance, because coffee dyspepsia bears a striking resemblance to alcoholic dyspepsia. There is the same disgust for food, morning expectoration of mucus, and marked anorexia. This disgust for food increases in severe cases until the patient can only take coffee or bread soaked in coffee. Nausea follows, and many of the other ills that flesh is heir to. Concerning the same evil Dr. Mendel of Berlin has published a clinical study which is the most thorough yet made, as he had a community of coffee drinkers under his constant observation, the working women in and about Essen. He found many of these women consumed over a pound of coffee a week. The leading symptoms of the ills that afflict them were profound depression of spirits and frequent headaches, with insomnia. A strong dose of coffee would relieve them for a time, then the ailment would return. The muscles became weak and trembling, and the hands trembled when at rest. The victims suffered so seriously they dared not abandon the drinking of coffee for fear of death." All this worked up into the shilling shocker form would be thrilling.—*H. and C. Mail*, July 10.

THE GALAHA CEYLON TEA ESTATES AND AGENCY CO., LTD.

This company is formed to acquire carry on, and develop a group of freehold tea estates, two freehold factories, and the general and agency business of Messrs. Chas. Strachan & Co., in Colombo. The vendor tells us in the prospectus that he estimates the profits for the next twelve months at £13,546. Why not give the actual net profits for last year or the year before, as he has managed the estates and business for many years? Investors could then see the increase of profits as the plantations come into full bearing. Under present conditions we cannot see anything in the prospectus to recommend investors to subscribe to this issue.—*Financial Bulletin*, July 4.

Tea, as a beverage, has been steadily growing in public favour despite the occasional onslaughts of various members of the medical profession directed against its effects on the nervous system. Consequently, it is not surprising that tea-growing is a remunerative industry, and many of the Indian and Ceylon companies are very prosperous concerns, and offer good opportunities for investment to those who want more than 2½ per cent or so for their money. It must not be supposed, however, that every tea estate pays, and the public must exercise caution and discretion in selecting those in which to invest. The Galaha Ceylon Tea Estates and Agency Company (Limited) does not impress us as one we can recommend. It is formed with a capital of £110,000, divided into £60,000 cumulative 6 per cent preference shares of £10 each and £50,000 ordinary shares of £10 each. There is also a debenture capital of £55,000 paying 5 per cent. The objects of the company are to acquire certain freehold tea estates, with tea factories, &c., in Ceylon, and the general agency of Messrs. Strachan & Co., in Colombo. The estates, business, &c., are to be purchased for the sum of £155,000 and the vendor takes the £50,000 of ordinary shares and the balance £105,000, in cash, so that his total interest in the concern will be comparatively small. We do not notice any independent valuation of the properties, &c., taken over. Another point calling for remark is that although the businesses have been carried on some time, no statement of the profits earned in past years is put forward. Instead thereof we have the vendor's estimate of sales, working expenses, &c., from July 1, 1896, to June 30, 1897, showing, of course, a satisfactory profit. We cannot say that this estimate will not be realised, but the intending investor will bear in mind that estimates of future profits are vastly inferior to statements of past profits as a basis on which to value a business. The concern may be perfectly good and sound—we know nothing to the contrary—but if so, the prospectus certainly does nothing to demonstrate the fact. —*Commerce*, July 1.

COFFEE IN THE KELANI VALLEY.

Mr. R. M. Dawkin, who to a certain extent, at least, is the pioneer of coffee planting in the Kelani Valley, has kindly furnished our representative with particulars regarding an experiment he has made on his estate of Kanangama. A year past in April a few bushes were planted, from a nursery, close to the conductor's quarters. These were carefully nurtured, precautions being taken to ensure that they were properly shaded, manured and watered. These bushes have thriven wonderfully, some of them being between 4 and 5 feet high. Quite recently there was a fair crop of blossom on them, which "for the good of the bush" was plucked off and not allowed to mature. In September last year Mr. Dawkin planted 100 acres in liberian coffee. The bushes, like those first experimented with, have a strong and healthy appearance and some of them have grown to a height of between two and three feet. It is Mr. Dawkin's intention to plant another 50 acres in liberian coffee shaded with dadup trees 20 feet apart. The "Laird of Kanangama" is well satisfied with the results of the experiment so far as it has gone, and he is hopeful that his acreage of coffee will have come into bearing in the course of two and a half years. At all events, he is determined to give the experiment a five years trial, holding as he does, that previous coffee growing trials in the K.V. did not get fair play owing to owners preferring to go in for tea which, at the time the experiments were made, was realising long prices. The Hon. T. N. Christie, we learn, takes an interest in the departure inaugurated by Mr. Dawkin and some day intends to have a look at the Kanangama coffee. We wish it and its owner the best of luck.

THE KOTMALE VALLEY ESTATES COMPANY OF CEYLON, LD.

The mail has brought us intelligence of the formation of this Company with a capital of £50,000 divided into 2,000 five per cent cumulative preference shares of £10 each and 3,000 ordinary shares of £10 each. The Company has been formed for acquiring from the Queensberry Estates Coy., Ld., the estates called Queensberry and Strathlonach situated at Kotmale Valley in extent 1,072 acres. The consideration for the purchase is £4·,120.

THE POMELO—COMMONLY CALLED GRAPE FRUIT.

This wonderful citrus fruit was introduced into Florida about 1839 from Jamaica and Pernambuco. It was planted more as a curiosity and not thought much of, only being eaten by the old Floridians as a Spring tonic and to drive away malaria, until the live Yankee got hold of it about 1881, and began to introduce it into the larger eastern cities. As it has great medicinal qualities the doctors of the east soon began to recommeud it for indigestion, and as a tonic to tone np the system in the Spring; also as an appetizer.

The majority of people who eat this fruit do not liko it at first, and many have not tried to like it on account of the extreme bitterness of the rink and membrane, or lining between the pulp. The correct way to eat this peculiar fruit is to separate, or take away all this lining, and eat only the pulp; or better still, cut the fruit open through the center, dig out the seeds and core, then sprinkle a little sugar over the pulp (working it in a little with a spoon or knife), let stand several hours or overnight; eat just before meals. This way one soon learns to like and even crave for it. Unlike strong drink or stimulants that create a craving appet te, the pomelo is not only harmless but beneficial, and will, I understand, even alleviate the rum appetite and if persistently used cure drunkenness.

There is nothing in the fruit line yet discovered that has the medicinal qualities of the pomelo. Hence, the demand will increase from year to year and take all the fruit that will be grown iu the United States for the next twenty years.

The product of Florida was about wiped out by the great freeze in that state in 1894-95, and this past season, what few pomelos the east obtained from the extreme southern border of Florida and South America, brought fabulous prices. A few boxes sent from California sold at from $10 to $20 per box in Boston and other eastern cities. Very common and poor fruit from Jamaica sold in Buffalo at from $12 to $15 per barrel. Of course these high prices will not continue when the live California planters get trees in bearing. There is not, however, any doubt but the demand has come to stay, and that it will increase as the fruit becomes known.

Now about varieties. Most people think there is but one variety. This is a mistake, as all fruits have different kinds. I travelled over all parts of Florida during the winters of 1890 and 1892 looking up the best varieties, and bought trees of what I considered the four best, and planted them at South Riverside. I found the Seedless a large fine fruit, having all the medicinal qualities desired with only an occasional seed; is a very luscious fruit. The one I considered next best was the Arantium, or Sweet Rind, a cross between the pomelo and orange. It has none of the bitter about the rind or lining, and only a trace of it in the pulp, and still much of the flavor of the pomelo as well as that of the orange, and will suit the taste of all. I do not think, however, that it has the medicinal qualities of the bitter rind. I also found a very fine fruit in St. Petersburg on the Gulf coast called Leonardy's Grape Fruit. This has as thin a rind as tho orange, is juicy, fine flavored, with all the medicinal qualities. I also found the Walters. The original tree was on the placo of a Mr. Walters at Belleview, Florida, and the fruit is the largest of tho bitter rind I ever saw. The tree was over twenty years old and had some 5,000 pomelos on it weighing from two to three pounds each. I secured trees budded from all four of these varieties, and have them all in bearing but the Arantium or Sweet Rind, which will probably bear some fruit this season. I consider these varieties the best yet discovered. The more common varieties of seedlings are about all called Triumph, and will stand in comparison to these varieties as the seedling orange does to the budded varieties.

The Seedless will undoubtedly take the lead over all others. The California growers who get the first orchards into bearing will undoubtedly have a gold mine in the shape of gold-producing fruit that will outdo all other fruits in this respect. It is no fad, but the demand has come to stay and will increase for years to come. It will take at least ten years of active planting for California to make up Florida's loss in this line. I have given this fruit my especial attention for at least five years, and if I were to do any more citrus planting it would bo nothing but the pomelo.

The tree is the finest of all the citrus family, is a thrifty grower, has large glossy leaves, and a tough wood that will bear its enormous weight of fruit without propping. I have seen as many as 6,000 pomelos on a single tree that would average 32 ounces each, or 12,000 pounds of fruit on a tree 22 inches through, the trunk three feet from the ground, and the tree over 49 feet in height, and 30 feet across its widest branches. This tree was 34 years old. The fruit from this tree sold for such a fabulous price that I will not mention it here for fear of being set down for a combined Florida and California liar.

C. B. HEWITT.

Pasadena, Cal.—*Rural Californian*, June.

BOTANIC GARDENS AT THE CAPE.—*Nature* of June 25 says:—

The *Agricultural Gazette* of Cape Colony publishes a letter sent by Sir Ferdinand von Mueller to Sir Hercules Robinson, the Governor of the Colony, and appealing for a reserve-ground for the preservation of rare Cape plants. As the veteran botanist of Victoria points out, the vegetation of South Africa is the richest in the world, not only as to number of species, but also as containing an astounding variety of plants of special and peculiar type, aggregated chiefly in the south-western provinces and occurring nowhere else. Hundreds of these are quite local and restricted to very circumscribed areas. They are sure to be swept out of existence altogether, unless special provision is made for their preservation; and it is on that account that the appeal is made for a wild-garden or reserve for the conservation of Cape plants in areas where they can be maintained for the knowledge of generations to come. It may be said that botanic gardens exist already in several parts of the colony, but in a report upon Baron von Mueller's proposal, Prof. Mac Owan remarks: "These places can only exist by making themselves into a lounge or pleasaunce of idle hours for the population living close by. I speak as one who knows, for it was my lot to run one of these for fourteen of the hardest and most unsatisfactory years of my working life. The conditions of support compel the place to grovel down into a nursery-garden in commercial lines, in order to get money enough to keep it presentable for the daily stroller. Nor did I ever dare to plant up any single portion of it with typical representatives of our Flora. The public would have taken the alarm at once. They care nothing for the special prehistoric flora of the land they live in, compared with the newest hideous abortion in chrysanthemums. . . . So that some of the gardens which we complaisantly call botanic, have it in them to stand between the living and the dead, and stop the slow and sure extinction of the most ancient and interesting part of our Cape Flora. This state of things, brought home to me yearly as I traverse the same solitudes each season, and note the increasing scarcity of rare plants, has been much in mind; but I do not see any other way of dealing with the matter, than by the reserve, now recommended, of chosen localities for all time and inalienable." But much as this is to be desired Prof. Mac Owan has to confess that the idea is not likely of even approximate fulfilment.

THE ASSOCIATED TEA ESTATES OF CEYLON, LIMITED.

The mail has brought us a copy of the prospectus of this Company which has just been brought out by Mr. W. H. Davies of Colombo with a capital £150,000, divided into 8,000 six per cent Cumulative Preference Shares of £10 each and 7,000 Ordinary Shares of £10 each. The Preference Shares are entitled to a Cumulative Preferential Dividend of 6 per cent per annum, and are also preferential as to capital. Mr. Davies' firm in Colombo have heard by wire from him that the capital offered for subscription was over applied for. Mr. Davies is forming another Company of the prospectus of which we are promised a copy shortly. Of the present company the officials are :—

Directors.—Sir Alexander Wilson (Chairman of the Mercantile Bank of India, Limited), London.

*S. R. Earle, Esq. (Director of Alsing & Company, Limited), 7, Oxford Court, London E. C.

John McEwan, Esq. (of the Allynugger Tea Company, Limited), 5 Billiter Avenue, E.C.

* Mr. Earle being a Director of the Malabar Company (Limited), who are the Vendors, will not act as a Director until after allotment.

Bankers.—The Bank of Scotland, 18, Bishopsgate Street, London, E.C.

The National Bank of India (Limited), London and Colombo.

Solicitors.—Messrs. Sanderson, Holland, Adkin & Co., 46 Queen Victoria Street, London, E.C.

Auditor.—J. M. Henderson, Esq., F.C.A., 2, Moorgate Street Buildings, E.C.

Brokers.—Messrs. Milln & Robinson, 2, Austin Friars, and Stock Exchange, London, E.C. Messrs. Hart & Watson, 63, St. Vincent Street, Glasgow, Messrs. Higgins N Paton, 21, Dale Street, Liverpool.

Agents in Ceylon.—Messrs. Finlay, Muir & Co., Colombo.

Secretaries and Managing Agents.—Messrs. McMeekin & Co., 5, Billiter Avenue, London, E.C.

Office.—31, Billiter Buildings, London, E.C.

The Company is formed to take over as going concerns, and to amalgamate under one management, the following carefully selected tea estates in Ceylon, and to purchase further estates as opportunity offers :—

Name of Estate.	Districts.	Tea in acres. Full bearing.	4 years.	Under 4 years.	Forest, Chena, &c.	Total.
Chesterford	..Kelani Valley ..	278	15	266	250	809
†Dukinfield	..Uda Pussellawa ..	210	—	20	54	284
Doragalla	..Pussellawa ..	620	—	—	371	991
Horagoda	..Kalutara ..	150	—	20	248	418
Madultenne	..Kelani Valley ..	150	--	52	85	287
		1,408	15	358	1,008	2,789

† Commonly known as "Silver Kandy."

The two principal estates to be taken over by the Company have been carefully investigated and reported upon by experts in Ceylon, and their reports, which are in great detail, may be seen at the Company's Offices. As regards the other estates, the figures have been taken from the Proprietors' Statements.

The following is a Summary :—

There is a total area of about 2,789 acres, of which
1,408 acres are in full bearing.
15 ,, 4 years old.
358 ,, 3 ,, and younger.
1,008 ,, Forest, Chena, &c.

2,789

The crop for 1895 was 663,628 lbs., yielding a net profit of.. .. £9,172 } at Exchange of 1/2 per Rupee.
The crop for 1896, taken on the usual basis of calculation for new tea coming into bearing, is estimated at 700,000 lbs., to yield a net profit of .. .. £9,461 } at Exchange of 1/2 per Rupee.

Of the increase estimated for 1896, so far as the year has gone, the actual result fully justifies the figures given. The reports referred to have been submitted to Mr. W. Forsythe, a well-known Ceylon planter, who is now in London, and he has expressed his satisfaction with the same, and has estimated that, when all the young tea comes into full bearing, there should be a considerable increase in the crop. The original report of Mr. Forsythe may be seen at the Company's office. At the price agreed to be paid for the estates, taking the Forest Chena, &c., at £5 per acre, the land under Tea works out at an average cost of the Company of £55 8s per acre, which, considering the high character of the Dukinfield Estate, is very reasonable. The present average output of the 1,408 acres of Tea in full bearing is at the rate of about 450 lb. per acre, and, when the 373 acres of young Tea come in, there should be a proportionate increase of revenue to the Company; besides which there would be the natural increase upon the Estates generally.

A feature in the selection of the Estates is the distribution over high and low-country, the properties ranging from Udapussellawa, at an elevation of 5,500 feet, to the Kelani Valley with an elevation of 450 feet above sea level. This should lead to a more uniform aggregate result than by having a series of properties all in one locality. There is ample Factory accommodation for present requirements upon the Estates, and there is an experienced staff of officials and employees, which will be taken over by the Company, so that the business will be carried on without any break in its continuity. The price to be paid for the five Estates above-mentioned has been fixed by the Vendors at £103,720, leaving a balance of £6,280 out of the present issue available for working capital, the Vendors agreeing to pay all the expenses in connection with the formation of the Company down to allotment. The purchase price is payable in Cash owing to the difficulty of adjusting, on the basis of a payment partly in Cash and partly in Shares, the interests of the several individual owners from whom the Estates were in the first instance acquired. The Vendors and their friends will, however, apply for a substantial number of Shares. The Vendors have agreed to make out a good title to the Estates to be acquired by the Company to the satisfaction of the legal advisers of the Company in Ceylon. The following Certificate has been given by Mr. J. M. Henderson, F.C.A., to whom the original Reports have been submitted for investigation :—

2, Moorgate Street Buildings,
London, E.C., 30th June, 1896.

To the Directors, the Associated Tea Estates of Ceylon, Limited.

Gentlemen,—I have compared the tables which you have prepared and submitted to me, as under, with the original Reports from Ceylon referring to the first two estates, respectively, and in the other three estates with the figures given by the proprietors, and Mr. W. H. Davies of Colombo, and I hereby certify that the figures showing the crops in 1895 and the estimated crops for 1896 are correctly extracted therefrom. I also find that the profits in 1895 and the estimated profits for 1896, as given in the said tables, are fairly deduced from the said Reports and statements, and the estimates given therein.

In the estates marked (*) the profits for 1896 are taken on the basis of 1895.

No provision, however, has been made for depreciation on buildings, plant, or machinery.

No. Estate.	1895 Crop. lb.	1896 Crop (estimated). lb.
1. Chesterford ..	172,000	190,000
2. Dukinfield ..	99,640	105,000
3. Doragalla ..	233,988	*220,000
4. Horagoda ..	67,000	*85,000
5. Madultenne ..	91,000	*100,000
Total crop ..	663,628	700,000
Profit ..	£9,172 0 0	£9,461 0 0

Yours faithfully, J. M. HENDERSON.

Taking the profits for the year 1896 as ..£9,461 it will be seen that the Dividend upon the Preference Shares is amply covered, 6 per cent. on £60,000 absorbing 3,600

leaving for Dividend on Ordinary Shares (£50,000), London Expenses, &c., the sum of ..£5,861 besides which there may be reckoned the increase of yield and revenue from the young Tea, which forms a reserve against contingencies.

The following contract has been entered into, viz.:—An agreement between the Malabar Company (Limited) and William Henry Davies of the one part, and the Company of the other part, dated 16th July, 1896, being a contract for the sale and purchase of the five estates above-mentioned.

No underwriting of the Company's capital has been effected, and the Shares will be allotted as far as possible *pro ratâ* on the application. It is intended to apply in due course for a Stock Exchange settlement and quotation.

THE CRAWFORD CUTCH CO.

We are glad to know that this Company's business at Trincomalee has now been thoroughly established by Mr. G. R. Murray, Secretary of the Company, who left by the last P. & O. mail steamer after a three months' stay in the island. The works, which are turning out at the rate of 6 tons per week, are in charge of Mr. Gillespie.

COFFEE IN NEW CALEDONIA.

Writing to a friend in Colombo, a gentleman well-known in Ceylon says:—

wrote you from Sydney, since which I was asked by a firm to come and report on some coffee plantations in this island. I have been here a month visiting a number of places. Coffee grows like a weed here, and it is grand to see old King Coffee looking so healthy with deep dark green foliage, and really good crops. It is wonderful how it does, seeing the careless cultivation and on land we would not dream of planting. Just fancy, it grows in the low land; the soil is rich chocolate 4 or 5 feet deep, but all grass land like our patanas. It is first scythed down, then ploughed 18 inch deep with a team of 4 bullocks (English); then the grass roots removed, harrowed, and coffee planted, and with it the blackwood tree for shade under which the coffee thrives most beautifully. "Bois Noir" or blackwood seems to kill the grass and weeds once the shade is established. Plants are put in about 8' by 6' and 9' by 5' and until the shade is established, ploughing is done between the coffee, the leaf mould formed from the leaves and seed pods of the Bois Noir are very great, and in fact in the 5 years no weeding is needed. Trees (coffee) are topped at 8 feet and no pruning ever done which is a pity as they are far too thickly knotted in the centres. I saw one field last week at Thio and St. Paul's about 25 acres carrying 12 cwt. an acre, and this on grass land that was. Government are getting out young men as planting emigrants giving them 15 acres each on forest land, and insist on the coffee being planted under shade, so that only the undergrowth is cleared, no burning, and coffee planted. Plants all shapes and sizes are put in by these men and in a few years this island will ship crops as large as Ceylon did. At present most of the coffee is dried in cherry. Some have pulpers but do not know how to set them. One place I saw pulp and cherry and parchment all coming through together and in some going into the pulp pit. I set this pulper for them, a Gordon's Disc, worked by a 16 foot water wheel. This wheel also works a set of stampers for clearing the parchment, a very slow process. The cisterns are about 4 feet square and high and in this they also wash or try to wash the parchment next day. After setting the pulper and surprising them with the clean way the pulper could work, I also made them make a washing cistern of planks and one day washed the parchment, bringing it to them snow white and no pulp or cherry as they did and put it to dry, and then picked the parchment out. Coffee is selling at 12½d per lb. here, and such rubbish, about equal to our native. The extent of this property is 13,000 acres, of which 500 acres are under coffee and the rest grazing, and about 2,000 acres good for coffee viz. forest and river flats. The climate at sea level equal to about Kandy or Gampola. Very healthy, no fever, in fact no sickness, and strange to say no animal or reptile lives on the island and very few birds. Locusts are bad at times. You can go through grass and jungle and no fear of any snakes. The owner of this land died 6 months ago and they want to realize coffee crop, 60 tons off 320 acres bearing and from cattle which gives about £3,000 profit yearly which pays for coffee cultivation. Last year they netted £6,800. The grazing land for stock I am going to try and get a company up to take it. Rice and cotton grow well but no labour, and the French men are too lazy and the kanaka coolies are good for nothing brutes, get R8 a month and fed with rice, meat and tea and don't pick half a bushel of cherry a day where our Tamils would bring in 1½ to 2 bushels or a box to a box and a half. There is a fortune here in rice and cotton and I wish I had some one with capital to take it up; there is a big fortune here. The island is full of minerals. On the tops of the mountains they get Nickel, Chrome, Cobalt, Copper, and Coal. Nickel chiefly; there is about 200,000 tons lying here waiting shipment, in fact a small mountain of it; owing to low prices the Company will not ship. Convicts are hired out by Government at 16s a month and their feed. Hoping to hear from you in Sydney, where I go tomorrow per "Armand Béhic."

THE RHEA FIBRE QUESTION.—Our Allahabad contemporary, dealing with this subject, warns Indian planters and merchants against lending their capital to machine-rushing companies and adds:—It is only fair to warn them that before the machine is tried the cultivation of the plant should be tried. Rhea is not like jute, which only occupies the ground for a few weeks. Once down it has to stay for years, and its value, as grown in any part of India, can only be tested by experiments extending over a considerable period. We are by no means prepared to say that rhea cannot be raised profitably in any part of India; or that with cheap labour one or two crops a year could not compete against the three or four crops in Java and similar regions where labour is comparatively dear. But it is none the less certain that accurate knowledge of the workable outturn of the plant and the cost of raising it should be obtained in any given locality before capital is sunk there in extensive plantations. If the Forest Departments in those Provinces where conditions are most favourable will consent to carry out experiments which will satisfy capitalists that rhea wands fit for their machine can be grown at reasonable cost and in sufficient quantity year after year, then, and then only, will they be justified in inviting the public to embark in the speculation.

CEYLON TEA COMPANIES AND THEIR DEBENTURES.

Vicissitudes have, writes a London correspondent, been experienced of late by Ceylon tea companies at home in the disposal of some of the debenture stock recently issued by them. It is not easy to realize what has been the cause for this. It seems only natural to expect that an assured interest of six per cent would, with the present value of money as low as it is, prove tempting to investors. It does not seem, however, that these are very ready to subscribe for the debentures of newly-started companies. Those companies that have established their position do not seem to find the least difficulty in placing the whole of such stock that they may desire to issue. But in their case it is the shareholders who readily subscribe for them, and they rarely have occasion to resort to the general public. It is a curious fact, that while new tea companies have little or no difficulty in disposing of their ordinary shares, the same facility is not experienced as regards those on which a fixed rate of interest is guaranteed. The explanation of this, our correspondent supposes, lies in the desire for a gamble. The public will venture freely when a chance lies before it of high, if risky, profits while it holds back from the more moderate, though more assured, profit to be secured from debenture stock investment. In a sense this tendency of the present day—one that is nearly all-pervading—is greatly to be regretted, but there seems little chance, at all events for the present, of its being superseded by a sounder and, as it seems to us, wiser one. And the subject invites us to consider another feature in the case of companies formed or in contemplation for the acquirement of tea properties in Ceylon. Every month almost sees more and more disposition to transfer estate property in this island into the hands of joint stock limited enterprise. We hear the question frequently asked whether this be a healthy sign, or if it bodes well for the future of our tea industry? Those who hold that it does not, rely greatly on the argument that there is going on a steady withdrawal of personal interest in the cultivation of estates that sooner or later will be found to produce ill-effects. Certainly that direct personal interest is becoming greatly limited. The proportion of acreage that is now cultivated by resident proprietors is narrowing in a ratio that seems to threaten such direction with almost entire extinction ere very long. Our correspondent calculates that at the present time quite two-thirds of this acreage is directed by paid superintendence that has no personal proprietory interest in the land dealt with. There are many who hold that this fact must produce results that may have a sensible effect on the future of our chief industry. It is asserted by these that in the past all the pioneering was done and the most favourable results secured by men who cultivated their own land. That these loved it with almost a fatherly affection had much to do, it is contended, with the energy that has time after time pulled the island through successive crises. Will, it is asked, that stimulus be as fully present should we again have to go through such hard times as have been again and again experienced in our planting history? It is difficult to avoid acknowledgments that there may be much force in the apprehension contained in such a question. Time alone can insure it. Meanwhile it is undoubted that the freedom as to working capital and the widespread interest in the island produced by joint stock endeavour is a stimulant not to be despised ; and perhaps this advantage may in the long run fully counterpoise that which it is urged we are abandoning.

TEA IN AMERICA.

New York, July 15.

New crop Formosas have been here about a week. They are flavoury but thin in the cup and not regarded as very desirable quality for teas. An invoice of 900 half-chests sold at 29c, which is regarded a very high average. Other Blacks generally are very dull and steady. Greens are doing little better. Congous steady. There is a great deal of activity in the campaign in favour of machine-made teas. The commissioners here advertise in the daily papers very liberally and are fostering a demand in this and neighbouring cities.

Today at noon the Montgomery Auction and Commission Company will sell 5,003 packages, viz : 693 half-chests Moyune ; 444 half-chests and boxes Pingsuey ; 136 half-chests Japan, basket-fired and sun-dried ; 763 chests Congou ; 35 boxes Capers ; 161 packages India, Java and Ceylon Pekoe, including all grades ; 789 half-chests and boxes Amoy, an attractive assortment of desirable clean leaf-teas ; 342 half-chests Foochow ; 1,640 half-chests and boxes Formosa, including the celebrated "Black Bear" mark.—*American Grocer*, July 15.

THE CASTLEREAGH TEA COMPANY.

On 3rd August the interim dividend warrants of 7 per cent payable on 1st August were sent out by this Company in respect of the half year ended the 30th June last. To the 30th June there had been secured 90,230 lb. tea against the original estimate of 180,000 lb. for the year, and this has been sold at the nett average price of 46·39 cents per lb. Although the total amount obtained, owing to better prices, is almost the same as last year, the crop secured to the 30th June was less than that at the same date in 1895, but on the other hand 195 acres have been pruned, whereas in 1895 all the pruning remained to be done ; and a crop of 200,000 lb. is now looked forward to. As this is also allowing for 35 acres of tea to be left alone, as it was over-plucked when young, the prospect appears to be exceptionally good, while we hear that the estate is in excellent order.—Local "Times.

THE NEW DUTY ON COCOA-BUTTER.

SIR,—Referring to your article on "Cocoa-butter" in the current issue of the *Chemist and Druggist*, we beg to point out that, although in our letter of July 8th we stated that cocoa-butter formed 50 per cent of the whole cocoa-bean, we named this as the exact percentage possible of extraction, and we regret that we led you thereby into supposing that it was usual to extract all this quantity in the preparation of cocoa powder, which is not the case. The actual amount varies with different makers of pure cocoa, from 23 per cent to 30 per cent of the whole material.

We also further stated that the husk of cocoa, which is subject to a duty of 2s per cwt., formed 16 per cent of the whole bean. We would point out that this is not the only loss in manufacture, and that 22 per cent to 23 per cent more exactly represents the whole waste.

If you will compare these figures with the others you quote you will easily understand the cause of variation in the percentage of final product obtained by various makers.—Yours truly,

July 15. C. BARRY & Co.

—*Chemist and Druggist*, July 18.

"THE INDIGENOUS DRUGS OF INDIA."

We have received from Messrs. Thacker, Spink & Co. of Calcutta a copy of the second edition, revised and entirely re-written, of "The Indigenous Drugs of India," by Kanny Lall Dey, Rai Bahadur, C.I.E., F.C.S., &c. The first edition of this work was published in 1867; and as the author still survives, and continues to actively engage in scientific pursuits, with the assistance of Mr. Wm. Mair, A.P.S., he has here brought together the results of nearly thirty years' additional investigations and discoveries, and has embodied them in this new edition of a book which is of great practical value for all engaged in planting as well as for medical men. Among other plants succinctly dealt with we may mention tea, coffee, cinchona, coconut, palmyra, areca, cinnamon, coca, ginger, cardamom, plantain, pepper, &c. As a specimen of the style of the work we quote the following on tea:—

CAMELLIA THEIFERA.

THE TEA PLANT.

Vern.—*Ind.*—Chhá, Chai.

A native of China (natural order *Ternstrœmiaceæ*). The tea plant, as grown in the hill districts of India, constitutes a very large proportion of the tea supply of the world. It is of little interest medicinally except that the dried Leaves (as well as the seeds of *Coffea arabica*, q. v.) are the source of the crystalline principle—*Caffeine*, also called *Theïne* and *Guaranine*, obtained by sublimation of an extract made by aqueous infusion and evaporation, astringent and colouring matters having been previously removed. It might be very profitably manufactured in India from tea dust. The average yield is 3 to 4 per cent. An infusion of tea Seeds was lately suggested by Hooper as a remedy for insect blights.

The seeds contain about 30 per cent. of fixed Oil, somewhat resembling olive oil.

Medicinal uses.—Tea is seldom used medicinally *per se*, except as a stimulant in strong infusion or as an astringent lotion on account of the tannin it contains. *Caffeine* and *Caffeine Citrate* are extensively used in modern practice and are of great value in migraine, hemicrania, neuralgia and similar nervous affections. Like a strong infusion of tea *caffeine* is stimulant, causing wakefulness. It has also diuretic properties. Physiologically the infusion of tea or coffee arrests the molecular change thereby instituting nervous force.

The book contains a portrait of the author, a memoir of whom is given by Mr. Mair. Dr. George Watt contributes a preface.

THE CLUNES ESTATES CO. OF CEYLON, LIMITED.

REPORT OF THE DIRECTORS.

The directors now have pleasure in submitting to the shareholders a duly audited statement of the accounts of the Company for the year ending 30th June, 1896.

The result of the year's work, after making ample provision for depreciation of buildings and machinery, shews a nett profit amounting to R50,811·69. An interim dividend of 7 per cent having been paid on 25th February last, absorbing R23,100.00, the balance now available for distribution is R27,711·69.

The directors recommend the payment of a final dividend of 8 per cent making 15 per cent for the year, and that the balance of R1,311·69 be carried forward.

The crop secured amounted to 345,670 lb. of tea, being 53,427 lb. in excess of last year. The nett average sale price was 40·13 cents per lb., whilst the cost laid down in Colombo was 23·37 cents per lb. The difference in average price realized this year, as compared with last, about six cents per lb., is mainly attributable to a lower level of sterling values and a higher range of exchange.

The Directors have considered it advisable to make a more liberal allowance for Depreciation this year—it will be noted that the sum set aside under this head is R4,525·73, against R1,380·94 last year.

During the year under review Mr. Dove, the Superintendent, was forced to leave the Island on account of his health, and the Directors, in consideration of past services, paid his passage to Europe and also allowed him six months' half pay, amounting in all to R2,190. The Estates are now in charge of Mr. R. O. Steward on Clunes and Mr. R. I. Mackenzie on Erracht division. The Directors are pleased to be able to report that all the work is being carried out to the entire satisfaction of Mr. S. L. Harries, the Visting Agent.

The Estimated crop for the 1896-97 season is 375,000 lb. tea on an expenditure of R78 210·00. The Capital outlay not included in the above is estimated at R9·960 for additions to Buildings and Machinery and for the planting next season of another 50 acres of Erracht Estate.

Mr. Donald Cameron having left the Island, on the invitation of the remaining Directors Mr. S. L. Harries consented to fill the vacancy. In terms of the Articles of Association, Mr. Wm. Forsythe now retires from the Board, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

CAMPHOR LEAF OIL.

The demand for a catch crop to be raised by Tea, Coffee and Indigo Planters is of so frequent recurrence that it may be of interest to republish a paper recently written by Mr. David Hooper of Madras on the subject of the Camphor Laurel Tree. The chief interest in Mr. Hooper's chemical investigations doubtless centres on the fact that he has shown that a fairly large supply of camphor may be obtained from an oil distilled from the leaves. Hitherto it has been supposed that in order that India might participate in the world's supply of Camphor, it was necessary to plant extensive avenues or forests and to leave the trees for 50 or 100 years before looking for any return. Obviously an enterprise on a large scale of that nature could alone be seriously entertained by Government, and little progress has accordingly been made, though it has been demonstrated that the plant can grow almost anywhere in India. The tree is an exceedingly elegant one, and where avenues are required might with advantage be planted more frequently than has been the case hitherto. The magnitude of the Indian import traffic in camphor should, however, in itself be sufficient inducement to justify the occupation of useless land by such trees even were half a century necessary before they could be expected to give any return. But if Mr. Hooper's discoveries be regarded as manifesting a possible new direction, returns might be looked for within so short a period as to give the Camphor Laurel Tree a position in the planting world it has not hitherto enjoyed. Mr Hooper, it will be seen, has been able to obtain Camphor in fairly large abundance from the oil distilled from the leaves.

It may be as well to here briefly indicate the botanical sources of the chief forms of Camphor met with in commerce in order to point out more clearly the particular plant to which reference is made in Mr. Hooper's paper. There are at least three plants known to afford camphor:—

1st.—CHINESE (FORMOSA) and JAPAN CAMPHOR.—This is obtained from *Cinnamomum Camphora*—the Camphor Laurel Tree.

It is the Common Camphor of modern commerce though not the article of historic fame. The tree is a very slow grower and for perhaps half a century would not very possibly attain greater dimensions than that of an elegant large bush.

The Japan Camphor is generally preferred to the Chinese as it is, as a rule, purer. It is prepared by boiling chips of the wood similar to the method pursued in India in the manufacture of Cutch. It comes into India in its crude state and a fairly large industry exists in refining it, chiefly at Bombay,

Delhi, etc. The refiner sells the purified article at nearly the same price as he purchased it, the profit being made on its mechanical absorption and retention of a large amount of water.

2nd.—BARUS CAMPHOR (Bhimsaini Camphor) obtained from a tree found in Borneo and Sumatra, etc., namely, *Dryobalanops Camphora*. This belongs to the same family as the Indian *Sal* tree. It is a large and handsome tree. To obtain the camphor the trees are felled and cut up into small splinters and the crystals of the naturally formed camphor picked out from the tissue of the wood. The crystals are chiefly found in the interior of the stem often existing as concrete masses which occupy longitudinal cavities, more especially near the knots and swellings formed where branches issue from the stem. The old trees are generally the most productive and a good tree, it is said, will yield about 11 lb. In searching for good trees the natives are reported to pierce the trees to the heartwood, but it is stated, that, if left for seven or eight years after having been pierced, they may then be found to yield a good supply. Only about one-tenth of the trees thus ruthlessly destroyed are remunerative.

This is the Camphor of the ancient writers, and naturally from the small amount obtained and the labour that has to be expended on its collection it is very much more expensive than the "Common" or "Chinese Camphor."

3rd.—NGAI CAMPHOR OF BURMA AND CHINA.—This is obtained from a species of *Blumea* and is manufactured very largely at Canton. The plant is a herbaceous or bushy member of the family of the COMPOSITÆ. It seems probable that several species are employed, that most commonly being *Blumea Balsamifera*—a species frequent in various parts of India as, for example, on the Eastern Himalaya between altitudes of 1,000 and 4,000 feet; on the Khasia hills, in Chittagong; Pegu and Tenasserim to China.

Ngai Camphor is chemically more nearly allied to Barus than to "China Camphor," and it is in point of price intermediate between these two forms. Good Barus Camphor may fetch R80 a lb., whereas the Common Camphor is little more than half that sum per cwt.—*Agricultural Ledger*, No. 5, 1896.

INDIAN PATENTS.

Applications in respect of the undermentioned inventions have been filed, during the week ending 18th July 1896, under the provisions of Act V of 1888.

Improving the machine known as Jackson's standard cross action rolling machines.—No. 247 of 1896.—Donald John Macrae, tea planter, of Harmutty tea estate, North Luckimpore, Assam, for improving the machine known as Jackson's standard cross action rolling machines.

For Treating Vegetable Fibres.—No. 108 of 1890.—Kenneth Thomas Sutherland's invention for treating vegetable fibres. (Specification filed 4th April 1892.) —*Indian and Eastern Engineer*, Aug. 1.

TEA IN NEW ENGLAND.

A letter written in England in 1740 says: "Tea is now become the darling of our women. Almost every little tradesman's wife must sit sipping tea for an hour or more in a morning, and it may be again in the afternoon, if they can get it, and nothing will please them to sip it out of but chinaware, if they can get it. They talk of bestowing thirty or forty shillings upon a tea equipage, as they call it. There is the silver spoons, silver tongs and many other trinkets that I cannot name." (Coffin, Newbury, p. 191).

Tea parties gradually became the fashion in New England about this period. In 1750 an excise was granted the King of 12d. per pound on tea. New Hampshire laid an excise of 2s. 6d. per pound on green and 'Bohea" tea. In 1763 about a million and a half of pounds were consumed in this country, only one-tenth of which came from England (Bancroft, iii., p. 59). Tea was a favorite return cargo with ships in the China trade. In 1793 three vessels carried 2,532 chests Bohea tea into New York and Providence, R. I.

Tea and coffee supplanted the use of alcoholic spirits in New England between 1713 and 1745. Weeden, in his "Economic and Social History of New England," says "that in this little Chinese leaf was folded the germ which enlarged into American independence." In 1714 Edward Mill advertised tea in the Boston *News Letter*: "Very fine Green Tea, the best for colour and taste." In 1718 it was not much used at Lynn, Mass., and when the ladies went visiting each carried a small teacup, saucer and spoon. In 1740 it was a "fad" among the women of Boston.

In 1666 tea was sold in New England at 68s per pound; in 1719, at 34s per pound; in 1721 and 1723, at 25s per pound for Bohea and Green; 1729, 45s per pound; 1730, 30s per pound; 1735, Bohea, 26s per pound; Congou, 34s; Pekoe, 50s; Green tea, 30s; 1737, Bohea, 16s & 26s per pound; 1745, 35s per pound 1756, £3, O. T., per pound; 1771, 3s per pound; 1773, Hyson, 18s, O. T., per pound; 1774, Bohea, £2 5s, O. T., per pound; 1780, 3s 9d per pound; 1782, 9s 9d per pound; 1783, 5s 10d per pound; 1784, 3s 11d per pound; 1785, 3s 2d, L. M., per pound; 1788, Bohea, 3s per pound.

The history of the tax on tea in 1767 and the subsequent attempts to have it removed is too famliar for repetition. A few items, however, will be new to many. In 1770 there were societies formed to discourage the use of tea. The women of Boston signed the following pledge:

We, the daughters of those patriots who have, and do now appear for the public interest, and in that principally regard their posterity, as such do with pleasure engage with them in denying ourselves the drinking of foreign tea, in hopes to frustrate a plan that tends to deprive a whole community of all that is valuable in life.

Then it was the leaves of the raspberry plant, thyme and other substitutes came into use. The users of China tea were forced to drink the beverage in secret places.

A memorial tablet has been placed by the "Sons of the Revolution" on the site made famous by the tea party. It measures 5 feet by 3, and is a bas-relief, representing a full rigged ship, from which men are tossing overboard chests of tea. Tea chests and tea leaves form the border of the tablet. The following is the inscription:

Here formerly stood Griffen's wharf, at which lay moored on December 15th, 1773, three British ships with cargoes of tea. To defeat King George's trifling but tyrannical tax of three pence a pound, about ninety citizens of Boston, partly disguised as Indians, poured the three ships' cargoes, three hundred and forty chests in all, into the sea, and made the world ring with the patriotic exploit of the Boston Tea Party.

No! ne'er was mingled such a draught.
In palace, hall or harbor,
A freeman brewed and tyrants quaffed,
That night in Boston harbor!

TEA IN OLD ENGLAND.

In 1746, John Wesley, after twenty-seven years' use of tea, abandoned its drinking in order to discredit its use among his followers and resumed the practice twelve years after by order of his physician. For a time he waged a war against tea drinking, but this, his biographer, Rev. L. Tyerman, says was "an amusing episode in Wesley's laborious life." Josiah Wedgewood, the famous potter, made and presented to Mr. Wesley a teapot which held four quarts. On Sunday mornings his preachers used to meet at five o'clock and take tea together.—*American Grocer*, June 24.

NOTES FROM OUR LONDON LETTER.

LONDON, July 24.

NEW TEA COMPANIES

are being largely advertised. During the week Messrs. Gow, Wilson & Stanton have announced that the Gartmore group of estates in Maskeliya, comprising about 632

acres and belonging to Mr. T. C. Anderson, have been placed in their hands for sale. Such an opportunity for floating a further new company is not likely to be neglected. The two new ventures announced during the week have been the India and Ceylon Tea Company and the Associated Tea Estates of Ceylon. Enclosed are the advertisements made by both of these That first mentioned you will observe includes in its direction the name of Mr. Thomas Dickson. His association with this company must certainly prove a tower of strength to it. The capital will total £500,000, of which the present issue is limited to £430,000 The Dooars Tea Company is the prime mover in this fresh enterprise. Very little doubt is felt as to the subscription asked for being fully met, though we find many who dislike the association of Ceylon with external interest. A clergyman devoted to Ceylon tea remarked to the writer yesterday that as a con sumer of that tea only he thought its reputation would suffer by the unition of interest. "Ceylon tea," he remarked, "should stand alone. It is *sui generis*, and to my mind Indian tea, such as we can obtain in London, does not compare at all favourably with it. The reputation of the Ceylon growth will suffer whenever the line of distinction between the two products becomes weakened. The public will always dread the amalgamation of these." This remark is of the character of others that one hears very widely expressed. It is certain that at the very outset this India and Ceylon Tea Company is experiencing a certain difficulty. The *Times* of this morning informed us that the subscription list for London was closed yesterday, and that for the country will close at noon today. But the same issue of the *Times* included the following letter:—

THE EAST INDIA AND CEYLON TEA COMPANY (LIMITED).

To the Editor of the "Times."

Sir,—With reference to the advertisement which appeared yesterday, we beg to inform you that on representation being made by us to the Registrar of Joint Stock Companies of the unfairness to this company's shareholders in allowing the name of the India and Ceylon Tea Company. he has informed us that the company has not, and will not be, registered under that name.

We need hardly express our surprise at the directors of that company advertising before registration was granted, or wishing to do so with a name so closely resembling that of this company.

We are yours faithfully, for the
EAST INDIA AND CEYLON TEA COMPANY (Limited),
P. R. BUCHANAN AND CO., Secretaries and Managing Agents.

45, Leadenhall-street, London July 23.

How far the facts thus disclosed may affect the position of this new company it is not for outsiders to say. Yet it would seem that the issue of its shares has been notified before even it had obtained registration, and of course to those who are not "in the know" this has a stange appearance. Can such a course have been legal? Or whether or not this may be so, is it one that in the interests of the public is to be justified?

The second company above referred to is the Associated Tea Estates of Ceylon. Of this venture the public advertisement is also sent you with this. In its case, again, Indian men are taking the lead—the Chairman of the Mercantile Bank of India, Sir Alexander Wilson, who is one of the directors, holds, in a sense, a cosmopolitan position, his bank having large interests in Ceylon. But the other two directors are both associated with Indian tea planting. The estates to be purchased in Ceylon are well-known ones of much reputation, and embrace 2,789 acres in Kelani Valley, Udapussellawa, and Kalutara. The capital in full is £150,000, and the present issue is 8,000 preference 6 per cent shares and 5,000 ordinary shares, £130,000 in all. The purchase price of the estates is to be £103,720, payable in cash. It is notified that letters of allotment and regret have already been posted, so perhaps it may be inferred that practically the subscription lists, which closed on Wednesday, have been filled up, though for reasons given in a previous letter it is by no means sure that this conclusion is to be fully accepted.

GANGWARILY ESTATES COMPANY OF CEYLON, LIMITED.

Registered July 4, by Harries, Wilkinson and Raikes, 38, Nicholas-lane, E.C., with a capital of £100,000 in £10 shares. Object, to adopt and carry into effect two agreements expressed to be made, as to the first, between John Drummond of the one part and this company of the other part, and as to the second between W. W. Nutshell, of the one part and this company of the other part; and, generally, to carry on, in all or any of their respective branches, the business of planters, growers, manufacturers of and dealers in tea, coffee, cocoa, cinchona, coconuts, spices, rubber, grain, fruit, cotton, rice, and other natural products of any kind; as shipowners, bankers, engineers, merchants, &c., in all or any of their respective branches, and any other businesses which can conveniently be carried on in connection with such businesses, or any of them, including the buying and selling of timber and the manufacture and sale of tea boxes, caddies, and other articles; to acquire and turn to account tea plantations in India, Ceylon, or elsewhere; as miners and smelters, restaurant proprietors, &c. The signatories are:—

	Shares.
J. J. G. Knight, M.L.C., Rose-hill, Stockbridge, Hants	1
W. H. Anderson, Rupert Lodge, Burnham, Bucks	1
T. Stretch, Billiter-square-buildings, E.C.	1
J. F. Hendrick, Billiter-square-buildings, E.C.	1
P. Somerville, Billiter-square-buildings, E.C.	1
E. G. Parish, Billiter-square-buildings, E.C.	1
W. T. Wilson, 13, Rood-lane, E.C. ..	1

The first directors—of whom there shall be not less than three nor more than five—are to be elected by the signatories. Qualification, £250. Remuneration to be fixed by the company. Registered office: Billiter-square-buildings, Billiter-square, E.C.

COFFEE PLANTING IN SELANGOR.

The following notes on Selangor Coffee planting may be of interest to your readers. The holes are usually placed ten feet apart and are cut eighteen inches in diameter and the same in depth. The cost is about half a cent per hole. Filling in costs nearly as much. The coffee is topped in the brown wood and generally at six feet. High trees are not liked owing to the difficulty experienced in picking the crop. Flat land is preferred to hill land, but that may be owing to the laterite coming to the surface on the hill while on flat land the laterite is more or less covered with alluvial deposits; also coffee on flat land is more easily worked. The estates are manured at an early age with mineral manures mixed with bones and poonac, etc., etc. Some of the planters have tried the system of leaving two and even three stems but the general feeling is in favor of one stem. Advances are not heavy and the coolies generally have no debt; if a cooly bolt to Penang, Malacca or Singapore the planter cannot sue him in the criminal court but may proceed against him for debt in the civil court at Penang, etc. Felling costs seven or eight dollars an acre, weeding about seventy cents. This is done by Javanese on contract and in return for a contract they supply coolies to the estate. Klings under indenture are not liked and the planters obtain free coolies either in Selangor,

or send a mandore to India to collect coolies. For the purpose no advance is given except for expenses and any small advance which the cooly has to repay is placed on the check roll and the mandore has nothing to collect from and has no claim over the cooly. I omitted to ask what inducement the mandore receives to collect coolies. The natives of Selangor are of little use to the planter. Chinese take holing contracts and Javanese cut the deep drains on the flat lands at about 12 cents a cubic yard, the drains are cut before the jungle is felled, say generally in 10 chain squares and three and four feet deep. Transport is good but expensive.—*British North Borneo Herald*, July 1.

INDIA AS A FIELD FOR INVESTMENT.—TEA.

In our pages some seventeen months ago,* we gave an account of this plant based on a paper read at the Society of Arts by Mr. Stanton, and we again turn to that venerable Institution for further information on the same subject, especially as regards the development of tea planting in the Dooars. The paper read on 4th May last by Mr. Geo. W. Christison, before Sir Richard Temple and others, was good itself and was the cause of eloquence in its hearers; eloquence to which we cannot hope to aspire, nor can we pretend to treat the subject in any way exhaustively, seeing that it takes up six pages in Balfour's Cyclopædia (who quotes 23 authorities) while Dr. Watt devotes eigthy-two pages of his Dictionary to the *Camellia Theifera*, of which his authorities or references take up no less than three whole pages. By the way it is envious [*sic*, for "curious"?—ED. *T.A.*] to note that both these great authorities give the German for tea as *Thi* whereas it should be *Thee*. And further some three months ago we ventured to give a little advice to the planters, a thing we had seldom done before, and will be chary of doing too often. Our purpose is now, however, not so much to give a history of the plant or a faithful record of work—but to show to those fortunate individuals who have more money than they know what to do with, that they might invest in worse speculations than in tea. In fact, that tea-planting has got well beyond the speculative region and that, given certain well known conditions, there is nothing pays better and is a more permanent source of steady income than a good tea-garden.

Sir Richard Temple only did them bare justice when he described the Himalayan tea planters as the pioneers of British influence and Western civilisation in regions adjacent to Tibet and the Chinese Empire. "When I look at him," said Sir Richard, referring to Mr. Christison, "I recall the memories of the glorious views, the mighty peaks piercing the sky, and the snowy summits and the picturesque spur on which the Tukvar plantation was situated right over one of the affluents of the river, the glorious panorama with which it is surrounded, the magnificence of the vegetable kingdom, the trees, ferns, and flowering shrubs." The best soil on these hills is found, as a rule, from 2,500 to 5,000 feet, though the plant does fairly well from 6,000 to even 7,000 feet; owing to the broken nature of the ground the roads are very winding and can only be used by pack animals and coolies, still their up-keep is very expensive in proportion to the area they serve, 4½ miles of road to 500 acres of ground! They are used by the Forest Department and serve vast tracts of native cultivation which in neither case contribute materially to their maintenance. Valuable as the Forest Department unquestionably is "profit should not be its chief aim" and if it were charged both land revenue and road cess it would realise all the more adequately "its immense reponsibilities in holding such vast territories." Of the 1,234 square miles composing the entire area of the Darjeeling district the Department holds 438; the Government Cinchona Department, 70; and native cultivators have an un-alienable right to 397, leaving only 329 square miles as grants to tea cultivators. Although hardly any land on the hills suitable and available for tea remains unplanted in the old hill District only "about 7½ per cent. of the entire district is actually bearing tea at the present time." Of the 486 square miles forming the new Daling Hill District no less than 421 square miles have been reserved by Government for Forest, Cinchona and natives; of the remaining 65 reserved for tea grants only 8 or 9 square miles have been taken up for the purpose and of this only 1,200 acres, and these close to the Dooars, have been opened out in spite of the eagerness for these grants. The 141 square miles reserved for natives and now largely in possession of Nepalis, who are aliens, and of aborigines and semi-aborigines in smaller proportion, consists of beautiful slopes, most desirable as a place of residence for Europeans and is as suitable a district for European colonisation as can be found any where in the East. The pity of it! *Now* the land has been "tortured, impoverished and bared of forest and would require to be allowed to lie fallow for many years before it would be suitable for growing tea."

The Terai, measuring 271 square miles, was opened out with "inordinately sanguine expectations" and at present "has become unduly depreciated in public estimation." The climate is undoubtedly unhealthy, but "under an improved water supply and sanitation this district should become more salubrious and with liberal and suitable cultivation, and efficient, but economical management, the Terai should yet compete, not unsuccessfully, with most other districts."

It would appear, therefore, that the only extension possible on a large scale is towards the South-East, where in the Dooars, there is enormous areas capable of tea cultivation, where the land is much more suitable for this purpose than in the Daling Hills as it produces a vastly larger crop. Here the planter would have the same advantage with regard to labour as his neighbours. To quote Sir Steuart Bayley, "The Napalese labourer had probably more intelligence and industry than those of any other part of India; and among the advantages which the Darjeeling tea-planters had over their neighbours in Assam—and there were many—was the fact that they drew their labourers from the neighbouring country. "As pointed out by Sir Charles Elliott," the two Tukvar gardens, including the one over which Mr. Christison presided, were instances of what could be done by good management. They did not recruit labour; they bred more labour than they could employ. The labourers lived upon these estates permanently; children grew up there and magnified to such an extent that one of the chief difficulties was to find employment in the garden for the children bred on the estates." The only rift in the lute is that Government, according to the planters' story, compete with them in the same recruiting ground and take the pick of the men for the army and the police, whereas there are plenty of other places whence recruits could be had and where planters or their agents come not. Sir Charles gave the official view of the question. "The immigration from Nepal referred to by Mr. Christison," he said, "was employed in three different ways—part went on to the gardens as they were extended, the greatest part went on to the land, especially independent Sikkim, where agricultural extension had been very large; and a small portion was recruited by the Government for military and transport service. All that could be done was to try and arrange that the competition should not be an unfair one." In the Dooars then we have climate suitable to Europeans and to the growing of tea, we have good soil and plenty of it, and cheap, abundant, excellent labour, and, further, every new tea-garden laid out creates a fresh demand for machinery. For it is by the use of machinery alone that India and Ceylon has ousted the Chinese products, and if only this fact should be driven into the heads of the vast host of tea-drinkers, the sales of Chinese teas to Europeans at any rate would dwindle down to zero—that is, as long as

* March 2nd, 1895, p. 127. Vol. XXIV.

they continue to manufacture the article in the crude and filthy way to which they are wedded with characteristic obstinacy.

And here we would venture to make a suggestion, promising that our Indian planters will join heartily in the Australian and American crusade, so pluckily carried on by their *confrères* in Ceylon. The continent of Europe is practically untouched, and yet there are many little colonies of Englishmen dotted all over it, which should be moved to help in the enterprise by precept and example. Tea is so easily brewed as compared to coffee, and, if it were made up into sealed packets containing quantities according to the weights and measures of the country, these would sell like "hot cakes," especially if in each packet there were enclosed a little tract with coloured illustrations of the difference between the Chinese manufacture by hands and feet, and the Indian manufacture by machinery alone.

The use of machines begins with the tree felling and conversion into logs for buildings, battens for chests or mere firewood. Then comes Jobens's Transplanter for moving seedlings with balls of their own earth from the nurseries to the field. A straight digging fork is preferable to the hoe or *Kodali* for cultivating. Mr. Christison mentions the case of an estate rejoicing in a head of water of 1,175 feet at the lowest point, which is only used for watering, drinking and fire extinguishing purposes, with a great length of pipes and hose, and there must be many such places. The plucking is all done by hand, but the "operations of tea manufacture are now performed by machinery in all factories of any importance. Steam is the commonest motor, but water-power (mainly by turbine) is also in use. In the case of the Tukvar Company, the turbine is situated in the ravine about two-thirds of a mile from and 1,500 feet below the level of the factory, the power being transmitted to the machinery there by means of wire rope, travelling upon pulleys supported on standards placed at suitable distances apart. The district owes the conception and accomplishment of this bold and arduous undertaking to the ingenious, indefatigable, and praise-worthy efforts of the late Mr. Thomas B. Curtis, of Tukvar, a well-known and most able tea planter. On another hill garden, electricity has for some time been employed, the turbine and generating apparatus being similarly placed beside the torrent far below and distant from the factory and machinery to be driven. For this laudable pioneer object-lesson in regard to the motor, which I believe to be specially suited and destined to be the power of the future for Darjeeling, we are indebted to the late much-lamented Mr. William Lloyd." And again we say there must be many such places where water power could be utilised to advantage.

After the leaf has been weighed it is withered on broad shelves of wire mesh, Hessian cloth or bamboo netting, over which a current of dried air is sent by means of ventilating fans. Then comes rolling by machinery of which there is an infinite variety. Mr. Christison swears by Jackson's "Rapid," which, he says, does the work of 70 men to great perfection. "By an ingenious arrangement of cranks, &c., an eccentric motion with elastic pressure (resembling that of the old hand rolling) is produced between a table and a box above which usually contains as much as 300 lb. of withered leaf at time. This upper plate or rolling box is generally of metal lined with wood, but also of granite or marble for greater coolness. The lower rolling surface or table is usually of wood, but is sometimes granite or marble-faced. This machine is beautiful though simple in movement, and is a roller as near perfection as can well be conceived" For sifting, dis-entangling the balls and aerating the rolled leaf, machines are also specially designed, "the withered leaf is fed into the hopper of the roller from the loft above by means of a canvas shoot, and the rolled leaf is discharged through a trap underneath into a trolly which conveys it to and from the sifter, and finally to the fermenting room." In this room a refrigerating apparatus would be useful, as the best quality of tea is made in the cold season when the oxidation occupies an unusually long time. Then come into action the drying-machines; of these also there are a great number of different kinds. We gave the essentials of a good machine, not long ago, in describing Gibb's.*

The important process of classification is also done by machinery aided by some "light finishing touches, hardly amounting to handling in any degree" given by "a few bright, tidy Nepali girls. Then, after a certain number of chests full have accumulated, comes the packing. Machine-made boxes are most uniform in tare and the machine-packing of tea obviates "trampling, unequal pressure, breakage and discoloration." The Davidson-Maguire patent packing machine is coming into use on the garden "and the sooner it is also universally adopted in the London warehouses, the better, not only for the above reason, but to supply the only missing link in the entire circle of machine manufacture." Wooden chests, although the material of which they are made has been well seasoned, will lose in weight during a long journey and voyage, thus causing confusion at its destination, but, if the chests were haskinised or vulcanised this would not happen, or if they were made of tin there would be no danger of leakage or damage by water.

The tea now falls into human hands again, for of necessity it has to be carried by coolies to the Railway Station or steamer. "Darjeeling tea is all carried by the hardy hill-men up the steep mountain roads to the nearest railway station on the way to market. It is no unusual day's work for a coolie to carry a tea chest weighing 110 to 130 lb. a distance of five or six miles, making, at the same time an assent of from 2,500 to 3,500 feet in sheer vertical elevation."

We have all heard the tradition of the Bhooteah who carried a grand piano along 50 miles and up 7,000 feet to Darjeeling. We know that "in the prosecution of their own trade, or on domestic affairs, they frequently undertake long, arduous journeys over ridges and along and across hot valleys, varying many thousands of feet in elevation, occupying many days on end, carring heavy loads of from 150 lb. to 200 lb. and over, and in addition their own food and bedding most cheerfully lighting a fire, cooking and eating their scanty meal, and going to sleep by the wayside."

We have, we hope, shown sufficiently clearly that tea-cultivation if carried on with ordinary common sense, in the right place and with the right men to work it, cannot fail of success, and as Mr. Christison truly concludes "investors in well-equipped concerns have, in these days of general agricultural depression, landed security of really the very safest class, from the fact of the tea harvest being over eight months annually. This secures the crop against the vicissitudes of season, in the form of a month or even two of adverse weather at any stage. We have lately given an abstract of the dividends made by tea-companies,* and we hope to revert to this subject again shortly.—*Indian and Eastern Engineer*, Aug. 1.

A NEW INSECTICIDE.

The highly poisonous nature of acetylene has suggested to M. Chuard the possibility of employing carbide of calcium as an insecticide for agricultural purposes. M. Chuard proposes to try thoroughly mixing the carbide with earth, so that under the influence of moisture acetylene would be slowly given off at the roots of plants, thus preserving them from attack. At the same time, the bye-products, consisting of chalk and a little ammonia, would have a beneficial effect on the soil. It is proposed to try this method against phylloxera. Whether this would succeed equally well in all weathers, wet or dry, is quite another question.—*Nature.*

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* January 1896, p. 24.

TEA COMPANY MEETINGS IN COLOMBO.

The following meetings of tea companies took place on Saturday, 8th August, in the office of Messrs. Whittall & Co., the agents and secretaries of the respective companies :—

THE MAHA UVA ESTATE CO., LTD.

An extraordinary general meeting of the shareholders was held at 11 a.m. Present :—Mr. C. A. Leechman (in the chair), and Mr. A. Thomson, directors; and Messrs. E. S. Anderson, and G. C. Walker, and James Forbes, by his attorney.

An interim dividend of 4 per cent for the year was declared and made payable forthwith.

THE GLASGOW ESTATE CO., LTD.

An extraordinary general meeting of the shareholders was held at 11-15 a.m. Present :—Mr. C. A. Leechman (in the chair), and Mr. A. Thomson, directors; Messrs. G. C. Walker, E. John, W. H. Figg, and Mr. G. W. Carlyon; and Mr. W. H. G. Duncan, Mr. A. E. Wright, Mr. E. C. Baillie by their attorneys.

An interim dividend of 8 per cent for 1896 was declared and made payable forthwith.

THE AGRA-OUVAH ESTATE CO., LTD.

An extraordinary general meeting of the shareholders was held at 11-30 a.m. Present :—Mr. A. Thomson (in the chair) and Mr. C. A. Leechman, Mr. W. H. Figg, directors; and Messrs. C. J. Donald, G. C. Walker, H. S. Rix, E. John, and H. Tarrant, and Mr. A. E. Wright, Mr. James Forbes by their attorneys, and Mr. G. H. Alston by his proxy.

An interim dividend of 8 per cent for 1896 was declared and made payable forthwith.

THE DUNKELD ESTATE CO., LTD.

An extraordinary general meeting of shareholders was held at 11-45. Present :—Mr. A. Thomson (in the chair) and Mr. C. A. Leechman, directors; Messrs. E. S. Anderson, H. S. Rix, and C. J. Donald; and W. H. G. Duncan and Donald Cameron, by their attorneys.

An interim dividend of 8 per cent was declared and made payable forthwith.

THE CLUNES ESTATES COMPANY OF CEYLON, LTD.

The fourth annual ordinary general meeting of shareholders was held at noon, when the following were present :- Mr. W. H. Figg, in the chair, Mr. S. L. Harries, directors; Messrs. H. S. Rix, E. John, and A. Thomson; and Jas. Forbes and G. W. Carlyon, by their attorneys.

The minutes of the 3rd annual ordinary general meeting of shareholders held on 16th August 1895, and the minutes of the extraordinary general meeting of shareholders held 25th February, 1896, were read and confirmed.

The report and accounts were then taken as read.

Proposed by the CHAIRMAN and seconded by Mr. E. JOHN, that the report and accounts as published be adopted.

Proposed by the CHAIRMAN and seconded by Mr. JAS. FORBES, by his attorney Mr. Walker, that a dividend of 8 per cent be declared and made payable forthwith.

Proposed by Mr. H. S. RIX and seconded by Mr. A. THOMSON, that Mr. W. Forsyth be re-elected a director.

Proposed by Mr. JAS. FORBES, by his attorney, and seconded by Mr. JOHN, that Mr. Hercules J. Scott be appointed auditor on the same fee as last year.

THE YATIYANTOTA TEA COMPANY, LIMITED.

An extraordinary general meeting of the above company was held at 12-45 p.m. Present :—Mr. W. D. Gibbon (in the chair), Mr. A. Thomson, Mr. E. S. Anderson, directors; Mr. H. S. Rix; and Messrs. W. H. G. Duncan, G. W. Carlyon, A. E. Wright, and R. Webster, and Mrs. Carlyon, by their attorneys.

The notice conveying the meeting having been read, an interim dividend of 10 per cent for 1896 was declared and made payable forthwith.

THE WE-OYA TEA COMPANY, LIMITED.

An extraordinary general meeting of shareholders was held at 1 o'clock. Present :—Mr. E. S. Anderson (in the chair), Mr. W. J. Smith, directors; Messrs. A. Thomson, W. D. Gibbon, J. A. Martin, G. C. Walker, H. S. Rix, and E. H. Vanderspar; and Mr Geo. Vanderspar, Mrs. E. C. Baillie, Major Gwatkin, and Mr. W. Cookes, by their attorneys.

An interim dividend of 10 per cent for 1896 was declared, and made payable forthwith.

THE UPPER MASKELIYA ESTATES COMPANY, LIMITED.

An extraordinary general meeting of the above company was held on the 8th August at 1-15 p.m. when the following were present :—Mr. W. D. Gibbon (in the chair), Mr. A. Thomson, Mr. C. A. Leechman, directors; and Messrs. G. W. Carlyon, W. H. G. Duncan, A. E. Wright, R. Webster, Cookes, Jas. Forbes, and J. Gibbs, and Mrs. A. N. Wright, by their attorneys; and by proxy, Messrs. G. H. Alston and T. K. Wright.

The notice convening the meeting having been read, an interim dividend of 6 per cent for 1896 was declared and made payable forthwith.

THE MOCHA TEA COMPANY OF CEYLON, LIMITED.

The ordinary general meeting of the shareholders of this company was held at noon on the 8th August at the office of the agents and secretaries (Messrs. J. M. Robertson & Co.), when Mr. F. W. Bois occupied the chair, the others present being :—Messrs. Edgar Vanderspar, W. E. Mitchell, W. Moir, E. John and H. Gordon Bois (Secretary).

The usual formalities over,

The CHAIRMAN brought up the Report of the Directors for the season ending 30th June 1896, which he thought, taking all things into consideration, might be considered a fairly satisfactory report, the only unsatisfactory feature in it being the fall in the average price of tea. This, as they would see, was almost 54 cents per lb., as compared with nearly 58 of last season's; but compared with the season before last it was not so very unsatisfactory. The crop had been in excess of the estimate and of that of last year. The Directors were endeavouring, if possible, to improve the value of their tea, and for that purpose they had before them a scheme for the erection of a turbine. With these few remarks he proposed the adoption of the Report and Accounts.

Mr. VANDERSPAR seconded.—Carried.

The report of the Directors was as follows :—

Your Directors beg to submit their report and accounts for the season ending the 30th of June last, which they trust will be considered satisfactory. The total quantity of made tea is 344,119 lb. which is 33,5[illegible] lb. in excess of the previous year. This yield is equal to 410 lb. per acre in bearing, and after deducting capital expenditure, the cost per pound delivered in Colombo was 25¾ cents, whilst the nett

average price realised was 53·61 cents as compared with 57·49 cents last season. The nett profit for the year is R100,131,73, which is equal to 24·78 per cent on the capital of the Company, and adding R1,563·71 the balance brought forward, there is R101,695·44 to be dealt with. Out of this, the Directors have already paid an interim dividend of 8 per cent, absorbing R32,320; a bonus has been paid to the Superintendent of the Mocha and Glentilt Estates of R2,000; there has been transferred to Depreciation account R7,924·33; there has been transferred to Reserve Fund R10,000; leaving a balance of R49,451·11—Total R101,695·44. It is proposed to pay a further dividend of 12 per cent. (making 20 per cent. for the year) R48,480, and to carry forward a balance of R971·11.

The Company's properties now consist approximately of:—840 acres tea in bearing; 15 acres under two years; 56 acres grass land; 123 acres forest and fuel trees; 21 acres buildings, roads, &c. Total 1,055 acres.

The estimates for season 1896-97 will be drawn up on a safe basis of crop and expenditure. Mr. Henry Bois, having left the island, resigned his seat on the Board of Directors, and Mr. F. W. Bois was invited to take his place. Mr. J. N. Campbell retires in accordance with the articles of Association, but being eligible, offers himself for re-election. The meeting has also to elect an Auditor for 1896-97.

DECLARATION OF DIVIDEND.

Mr. JOHN proposed the payment of a dividend of 12 per cent for the half-year, making, with the interim dividend of 8 per cent, 20 per cent for the year.

This was seconded by Mr. MITCHELL and carried unanimously.

DIRECTOR AND AUDITOR.

On the motion of Mr. MITCHELL, seconded by Mr. JOHN, Mr. J. N. Campbell was re-elected a Director; and Mr. H. J. Scott was re-elected Auditor for the season 1896-97, on the motion of Mr. VANDERSPAR, seconded by Mr. JOHN MOIR.

MARKET FOR TEA SHARES.

Thursday Evening, July 23.

Business in most of the older and better known shares has been rather neglected the past week in favour of the rush for new issues, which are being freely offered to the public; some good, others less desirable, so far as intrinsic merit is concerned. The generality of the best shares, however, keep firm in price, the lack of business resulting more from the firmness of holders than from any weakening in the demand.

CEYLON SHARES.

C. T. P. Co. Ordinary.—Nothing further done; but the Prefs. have been done at 18.

C. and Oriental £3 paid shares came on a little cheaper at 3¾, but have since been taken at 3⅞. Some fully-paid shares might be had at £7.

Ceylon Land shares are being asked for.

Dimbula Valley Ordinary have been done at 5⅝, and are firmer, and the Prefs. have touched 6⅛ and 6 3-16.

Eastern Produce shares have touched 6½.

Ceylon properties are being freely mixed with Indian ones in many of the new issues.—*Home and Colonial Mail*, July 24.

PLANTING AND PRODUCE.

THE CHANCELLOR OF THE EXCHEQUER AND THE PRICE OF TEA.—The statement about the price of tea recently made by the Chancellor of the Exchequer in the House of Commons, and reported in our issue of July 10th, has called forth remonstrances from the tea trade. Messrs. Morris and Jones, of Liverpool, say on this subject: "It was a pity that when the Chancellor of the Exchequer made the misleading statement in the House of Commons about teas some members who understood the matter did not explain how the average was made. There is a lot of rubbish imported into this country and sold in public sale at about 3d per lb; common sorts of better grades fetch 5d to 6d; medium sorts 8d to 10; and so on up to about 2s per lb, and some really fine kinds fetch 3s to 4s and even more. To take one public sale, say—3,000 chests at 3s per lb (in bond duty 4d); 8,000 chests at 6d per lb; 12,000 chests at 9d per lb; 4,000 chests at 1s per lb; 3,000 chests at 1s 6d per lb; 2,000 chests at 2s per lb. This will work out the average price given by the Chancellor, 9d to 10d. Unfortunately the tendency to cheapness in everything induces the public to purchase low-priced teas, but those sold at 1s and 1s 4d have none of the flavour and aroma and invigorating properties of the better sorts, and those who love good teas would never think of using them."

TEA IN NATAL.—Tea planting on the coast in Natal succeeds well, and there is a considerable amount of capital invested in the industry from which important results are expected. Natal tea for South Africa is the idea. A correspondent of the *Globe* writing on the subject says: "The labour is a very grave consideration. It has to be imported; and then it must be trained. It is infinitely more difficult to find a market for tea than for sugar. Tea is not a commodity which improves with keeping, although a certain time is necessary for it to mature its flavour. The estates, which are situated on the coast beyond Verulam, suffer considerably for want of a railway. The actual freight may be higher than the cost of the present waggon transport to Verulam; but in wet weather the risk to so delicate a product as tea is very great. Besides, there is the commercial inconvenience of the delay in delivery, owing to the flooding of rivers. Waggons have been stationary on the banks of the Unvoti River for two months at a time. Some years ago a great effort was made by Mr. W. R. Hindson, of Nonoti, to induce the Government to extend the railway into the tea district. His firm undertook to provide the capital necessary for laying down the new line; and it is to be regretted that the then Government did not see the great discouragement which would have been given to this young industry by such an enterprise. At that time, however, responsible government had not been granted to Natal, and the Governor, Sir Charles Mitchell, did not approve of railways being made in the colony by private enterprise. Quite recently—partly owing to the harbour developments at Durban and the desirability of tapping the coal supplies near the Tugela—the matter has been pushed forward, and a concession was granted to a syndicate for the construction of this line at the close of last year. At Mr. Hindson's estate at Nonoti there are 500 acres laid down in tea. The business has only been in existence twelve years; and, considering that it takes five years before tea plants will show a profit on their cost, it must be owned that a great deal has been accomplished in the twelve years. A new industry of the kind must be experimental at the outset, and proportionately costly. The best kind of tea, both from the consumer's and the grower's point of view, has to be found. Both soil and climate are distinct factors in tea-growing. In fact, the influence of soil and climate appears as marked in tea as in wine—either prejudicing or improving the flavour. The tea at Nonoti is known as the Assam Hybrid, but there is great inequality in the leaf. Mr. Hindson is trying the introduction of a new Indian tea, which he hopes will be an improvement. Perfection has not been reached, but there is such a steady improvement shown that it is confidently hoped that Natal teas may equal those of India and Ceylon. Three things are evident: firstly, that the natural produce of the tea-plant itself is far more abundant in Natal than in India; secondly, that, owing to the climate, coolie labourers can undertake twice the amount of land in Natal that they can in India; and, thirdly, that an increasing local market already exists, which is scarcely the case in India. Mr. Hindson grows all the green leaf which he requires for his own factory, but the large mill at Thearsnoy, belonging to Messrs. Hulett,

though supplied with a very large acreage, also works up considerable quantities of green leaf from small growers. As much as 500,000 lb. were manufactured in one year at Thearsney. The mill has since been destroyed by fire, and is at present undergoing repairs.

IS THE CAUCASIAN PLAYED OUT?—Whether the Caucasian is "played out" or not his operations in tea cultivation are likely to achieve that proud position. According to news from Odessa the great expectations formed as to tea cultivation in the Caucasus are not likely to be realised. A report from Batoum states that the Minister of Domains does not feel inclined to continue the Government subsidies to the planters along the Caucasian coast, as the results of their efforts have hitherto not been satisfactory enough to warrant any further expenditure on their behalf. Neither the quality nor flavour of the tea grown in this region is satisfactory, and this notwithstanding the fact that one or two planters have imported skilled Chinese growers to take the oversight of the harvesting and drying operations. As the Chinese methods of drying are, to say the least, antiquated, it is not surprising that they have failed to teach the Caucasian planters much.—*H. and C. Mail*, July 24.

CULTIVATION OF VANILLA IN MEXICO.

The following information on Vanilla is taken from Sir Henry Dering's report on the productions of Mexico, already referred to:—Vanilla is found growing wild in many districts of Mexico, and it is cultivated in Michoacan, Puebla, Oaxaca, Tabasco, Vera Cruz, and other places. There are six varieties of vanilla known in Mexico, namely the "mansa," the "cimarrona," the "mestiza," the "pompona," the "puerco," and the "mono." Of these the mansa and the pompona are cultivated. A rich vegetable soil, such as is found in the dense forests of the Tierra Caliente, is best for vanilla cultivation and growth, and in such localities the vine grows luxuriantly, and gives a large pod. The months of June and July are considered in Vera Cruz and Tobasco as most appropriate for planting, and the plants will commence to flower in the second year after planting, and full crops may be expected between the third and fourth year. The flowers appear in March, April, or May in clusters of 20 to 50. The fruits goes on growing for a month, but it will take at least eight mouths longer to ripen sufficiently for harvesting. The proper time for the ripening of the vanilla in the districts of Tuxpan, Misantla, and Papantla is in the month of January, February, and March. The bean, if allowed the necessary time to ripen properly, is black and juicy, and, when well prepared, will keep good for many years, but, if gathered before maturity, is bound to be defective. After the beans are gathered, they are plunged for half a minute into hot water that is almost boiling. They are then put on mats to drain dry, and afterwards are spread out on blankets and exposed to the sun, and in the evening they are shut up in tight boxes to ferment. The box in which the vanilla is to be sweated must be put in the sun during the day to warm it and it must be big enough to hold all the vanilla that has been spread out. The sunning process is continued for a week, or until the pods become brown and pliable, when they are squeezed between the fingers, to straighten them, and to cause the seeds and oily substance inside to be evenly distributed. After the operator is satisfied with his work of sweating, the vanilla beans are then separated into sizes of length, thickness, colour, and appearance. The Mexican vanilla dealers have established five grades, namely:—First, vanilla "fina" or "legal," the beans or pods from 6½ inches long or upwards, short in the neck, sound and black; the beans which become split, or open, provided they have the foregoing qualities, and the split does not extend more than a third of the pod. This class is again subdivided into "terciada," which is composed of the shortest pods; "primera chica," "primera grande," "marca menor," and "marco mayor," the largest of all. Second, vanilla "chica," those pods which differ only from the terciada, in being shorter, two of them counting as one of the first-class. Third, vanilla "zacate," the pods of all sizes, which are off colour through being gathered before becoming ripe or being over cured, "pescozuda," "vana," "cuerada," and "aposcoyonada," names for pods in a more or less damaged condition. Fourth, vanilla "cimarrona," the wild vanilla, in good or fair condition, three pods counting as one of the first-class. Fifth, the "rezacate," composed of the very short pods, of those split clear up to the stalk, of the badly damaged, of the very immature, and of the very much overcured. After the sizing and classification is finished, the pods are tied up in bunches of 100 to 150, so as to weigh one pound, and wrapped up in paper and tinfoil. Statistics show that there is more vanilla exported from the port of Tuxpan than from any other port in the world, thus establishing the fact that the Tuxpan valley is the natural home of this valuable orchid. As much as 300 per cent. profit has been made in good years by those engaged in the vanilla industry in Mexico.—*Journal of the Society of Arts*, July 17.

LONDON TEA LETTER.

(FROM OUR OWN CORRESPONDENT.)

10th July, 1896.

L. M. B.

In regard to the Land Mortgage Bank a special meeting of the shareholders was held last week to consider the offer of £366,000 odd made by Sir John Muir, Bart., and Mr. P. R. Buchanan for the properties of the Bank. This offer the Board of Directors had recommended the acceptance of by, or rather had actually accepted subject to the approval of, the shareholders. The Chairman, Mr. R. J. Boyson, informed the meeting that the offer he confidently believed would enable the Company to liquidate, pay off all liabilities, and distribute £1 per share (or at the least not less than 19s 6d) to the shareholders. Some discussion followed, in which it was as a matter of course made doubly plain that the £1 or thereabouts per share would be all the shareholders would receive, that though shares had been bought at a premium, as they had been by many, the £2 *paid*, or no portion of it, would be refunded in addition to the £1 estimated; and it was also extracted that under the conditions of the offer made by Sir John Muir, the present shareholders of the Bank would have the privilege or option of an allotment of an equal amount in any company formed with the gardens of the Bank, or in any company of whose holding these estates might go to form part. The resolution approving of the sale of the estates was passed without any opposition or dissent, and now only remains to be confirmed at another special meeting (to be called for on the 21st instant), as will doubtless be done. There was some grumblers among those in the meeting who had purchased their shares at a premium. But upon the whole the arrangement is a very satisfactory one for the shareholders. The Company, though called a Bank, has long been nothing more or less than a large and unwieldy tea company with a Debenture Debt (though judiciously reduced within the last twenty years) still much larger than is paid up capital. There also remained the heavy liability on the shares, £18 being unpaid and liable to be called up. About twenty-five years ago, or even less, there was a considerable section of the shareholders who wished to see the Company wound up and they themselves freed from this liability. Had this been done then, doubtless there would have been a considerable call per share to enable the liquidation to be carried through, instead of any return of capital afterwards. Through good report and bad report Mr. Boyson continued sanguine, and he has to be congratulated, and the shareholders are greatly indebted to him for his persistency and courage. Of course Mr. Boyson has been a lucky man. The mainstay of the Bank was tea, and the fall in exchange and the present boom in tea investments has brought about a revolution, that the most

sanguine had no reason to hope for and perhaps never dreamt of twenty-five years ago or even much more recently. Mr. Boyson has laboured for thirty years for the Bank, and is not a young man. He, more even than the shareholders, has every reason to be highly gratified with the result. May he long enjoy his well-earned repose. It is quite true that there was not a single shareholder in the room, and certainly excepting Mr. Boyson himself (the purchasers were not present), can have much idea of what is the fair value of the Bank's gardens, but many know what the result of working them in the past has been, and in the future there will be ups and downs in exchange, markets, and all the other risks that have hitherto had to be encountered in regard to management, labour, blights, etc., &c. The chances are the gardens would be no better managed for them than they have been in the past, and, though it is to be hoped times may be better the chances are, I think pretty certain they shall be worse. It is not unlikely that the practical advisers of the purchasers know the advantages and capabilities of the widely scattered gardens all over a great deal better than anyone else. Be it so. It cannot, however, be denied they are paying a very fair, what would seem even a very full, price for them, and everyone, including the L.M.B. shareholders, may cordially wish the purchasers every success in their investment, that can be achieved by more skilful and efficient working of its gardens.

CONSOLIDATED TEA AND LANDS CO.

Little more has transpired regarding Sir John Muir's monster company. I have heard it said by those who should be best informed *outside*, that the two millions of capital was subscribed several times over! I saw in the money column of one of our daily papers, that "the first batch of letters of allotment and regrets" had been posted. Though that is some time ago, I have noticed or learned of no other intimation in the Press. It is also rumoured that several large applicants have been allotted two or three shares each, and I have seen it quoted that each class of shares, 1st and 2nd Preference and Ordinary are already quoted at £1½ to £1⅞ premiums each! So much evidently for the increasing eagerness of the sanguine investing public for tea shares.

FURTHER SALES AND NEW COMPANIES.

Nothing seems to transpire as to who are to be the bidders for the Dooteriah concern to be exposed at auction in a few days. Messrs. Duncan Bros. were the highest bidders formerly. It can do no harm for me to hazard a few remarks, as long before this can reach you the matter must be finally settled. Nothing has been mooted in regard to Sir John Muir in this connection, but if the present owners do not consider it too good a thing to let slip from them, or even if they do I should be inclined to back the chances of Sir John Muir, who up to date has the record as a purchaser in Darjeeling since the 1863 days, to the advantage of one of the most deservedly respected citizens Darjeeling ever knew. But I do not speculate so much on that, as I rely upon the universal truth of the saying of a shrewd friend in one of the tea countries that "when a man once gets fairly smitten with the land fever (in connection with tea sepecially), there is no satisfying him till he gets laid in it himself." Of course there is this in favour of the present partners, that they will only have the half of the purchaso money to find; and as the bidding progress, they must know better than others when the point has been turned that makes it safer for them to be sellers than beyers. I, however, back the honorable Baronet (if he really cares for the property) and his friends. With tho "L.M.B.," "D.F.B.," "K.F.B." and "T.F.B." and Bloomfield combined in one monster Darjeeling Company, it would amount almost to a monopoly, and the Darjeeling Company, and its time honored Managing Director, Mr, Roberts, would be nowhere. Of course men of capital and enterprise like Sir John Muir do an immense deal of good to tho natives of India and the country, and in the long run even to the tea industry, which the weak, timid and narrow-minded fear he is about to swamp through the magnitude of his undertakings.

The prospectus of the Darjeeling Consolidated Tea Company, Limited, that has been formed, as I before mentioned, to take over your Calcutta, Balasun, Gyabaree, Singbulli and Murmah and Ting Ling Companies of Darjeeling, is expected to be issued daily. The capital is to be £120,000 half in 5 per cent. cumulative preference shares, half in ordinary shares.

Another new company is reported as being formed to purchase the splendid estates of the Borjuli Tea Company and the Dapoota Tea Company in Assam, and certainly extraordinary general meetings of the shareholders of these two companies have been summoned to take into consideration the proposals to purchase the properties of these two companies as going concerns from 1st January 1896. The prices named are £183,945 for the former and £63,000 for the latter, the respective capitals for which the concerns were floated for about two years ago being £120,000 and £41,000 respectively.

What is to be the next surprise? Or is tea company-promotion destined soon to have some little respite? May all end well for the confiding investing public. Up till a very few years ago it could be asserted that almost as much had been lost as ever was made iu Indian tea, and that the larger proportion of the gains had been through company-promotion and the "turn-over" of companies and shares May the same not have to be said four or five years hence?—*Indian Planters' Gazette*, Aug. 1.

THE ASSOCIATED TEA ESTATES OF CEYLON, LIMITED.

With a capital of £150,000, divided into 8,000 six per cent cumulative preference shares of £10 each and 7,000 ordinary shares of £10 each, the Associated Tea Estates of Ceylon, Limited, has been formed to take over as going concerns, and to amalgamate under one management, the following tea estates in Ceylon, and to purchase further estates as opportunity offers: Chesterford, Kelani Valley; Dukinfield, Uda Pussellawa; Doragalla, Pussellawa; Horagoda, Kalutara; and Madultenne, Kelani Valley. The prospectus states that a feature in the selection of the estates is the distribution over high and low country, the properties ranging from Uda Pussellawa, at on elevation of 5,500 feet, to the Kelani Valley with an elevation of 450 feet above sea level. This should lead to a more uniform aggregate result than by having a series of properties all in one locality. There is ample factory accommodation for present requirements upon the estates, and there is an experienced staff of officials and employees, which will be taken over by the company, so that tho business will be carried on without any break in its continuity. The price to be paid for the five estates above mentioned has been fixed by the vendors at £103,720, leaving a balance of £6,280 out of the present issue available for working capital, the vendors agreeing to pay all the expenses in connection with the formation of the company down to allotment. The directors of the company are: Sir Alexander Wilson (chairman of the Mercantile Bank of India, Limited), London, S. R. Earle, Esq. (director of Alsing and Co., Limited), and John McEwan, Esq., (of the Allynugger Tea Company, Limited.)—*H. & C. Mail*, July 24.

INDIA AND CEYLON TEA COMPANY, LIMITED.

With a capital of £600,000 in 300,000 preference and 30,000 ordinary shares of £10 each, the India and Ceylon Tea Company, Limited, has been formed to acquire, and combine under one management, the following going tea concerns, which, excepting the Ceylon properties, are taken over from January 1 last:—(1) In Assam: The properties of the Borjuli and Dapoota Tea Companies. (2) In the Dooars: Tho properties of the Good Hope and Kumali Tea Companies and tho Haiha Patha and Dangua Jhar Estates. (3) In Ceylon: Tho Lebanon group of tea gardens and the Knuckles group. The total area of

these properties is nearl 18,000 acres. The purchase price is £418,000, of which £346,280 is payable in cash, £4,000 in fully-paid preference shares, and £67,720 in fully-paid ordinary shares of this company. The present issue is of 21,900 preference and 21,900 ordinary shares. The directors of the company are W. H. Verner, Esq. (chairman), Sir W. W. Hunter, K.C.S.I., C. A. Verner, Esq., W. S. Wells, Esq. (chairman and directors of the Dooars Tea Company, Limited, and the Singlo Tea Company), W. K. Darley (managing partner of Haiha Patha Estate), Thomas Dickson, Esq. (director of the Scottish Trust and Loan Company of Ceylon, Limited), and H. N. Gladstone, Esq., director, Singlo Tea Company, Ltd. —*H. and C. Mail*, July 24.

TEA IN THE INDIES.

HOW THE PLANT IS GROWN AND THE LEAVES CURED.

CONSUMPTION OF THE BEVERAGE IS INCREASING—MODES OF CULTIVATION AND CURING ALWAYS IMPROVING.

Only a comparatively few years ago the people of the United States knew little of the teas that have of late years made such wonderful strides in displacing China and Japan teas in British markets, and which have recently shown such a large increase in consumption in this country. Notwithstanding that tea is a household beverage, not many know much of its cultivation, either in India and Ceylon or in Japan and China, or that for years, through governmental instrumentality, experiments have been going on in this country, principally in North Carolina, Florida, and California, looking to the propagation of tea in the United States. Regarding the latter, the cost of labor and unfavourable climatic conditions are hard nuts for the experimentalists to crack, and it cannot be said that the work so far has been at all satisfactory, although tea of good quality has been grown, but not for commercial purposes.

To those who know little of the actual work of tea raising or the various processes the leaf must go through before it is ready for use on the table, a short history of the tea plant from its inception will be both interesting and instructive.

As a matter of fact, tea is indigenous to India and was transplanted to China and Japan, as well as to Ceylon, the latter place having been a large coffee producing country, and would probably have so continued had not the leaf been attacked by a scourge which sapped the energies of the plant. The growers seeing starvation staring them in the face, then turned their attention to the cultivation of tea as a means of livelihood, although at first it must be confessed with not great hopes of success, although tea was being cultivated in India, a climate very much similar to that of the island of Ceylon.

TEA SUCCEEDS COFFEE.

The tea seed was first planted in the fields upon which the coffee trees were growing (dying, perhaps, would be the better word), although the plantation owners still had hopes that the disease would be checked. As the tea bushes approached maturity, and the chances of success improved, the coffee trees were uprooted and the tea plants were left in full possession of the field. Three or four years are required before a tea plant becomes productive, the plant in those climates requiring no moisture other than that provided by nature. After a growth of fifteen months, the first important work must be done, and this is called "topping," the object being to keep the plant (it would grow to a tree) at an average height of four feet. All the surplus branches are taken off except the stem and short ones, the surface of the plant being flattened. The work is done by coolies, and that the task is a hard one is shown by the fact that a field of fifty acres will have between 175,000 and 200,000 bushes. After the plants have matured, the leaves are plucked, and this is a task that requires deftness, as well as care and judgment. The early growth of the leaf makes it firm, and it is in the selection of leaves for the different varieties that the judgment must be shown. If fine qualities are wanted, only a small number of leaves from each shoot will be taken, while if quantity is the principal thing wanted extra leaves will be taken from every shoot.

So expert do the native work people become that it is only necessary to tell them the special grades and they will quickly pass over the bush, selecting only such as are needed. Great care must be taken that the eye or bud shall be left unbroken on the branch.

FAR ABOVE SEA LEVEL.

In Ceylon the tea plant flourishes from 100 to 7,000 feet above the level of the sea, if the soil is rich and the climate favourable, but most of the gardens are laid out on the slopes of hills and mountains. The higher the altitude the less the yield, but the greater the fullness and flavor.

In picking the coolies carry baskets hung from their heads by ropes, the leaves, as picked, being thrown over the shoulder. Each picker's basket has a capacity of about fourteen pounds, which, when full, is emptied into a larger receptacle set at the end of each row. Every plantation of any size has its own factory, a two-storey building with heavy roof, run either by steam or water power, so that the tea in all its processes is handled exclusively by machinery. This use of machinery is one of the real reasons for the enormous increase in the consumption of British-grown teas, as it entirely obviates the use of the hands and feet employed by the Celestials in the rolling processes.

Withering is the first process the leaves undergo upon reaching the factory. Long shelves, covered with Hessian jute, are arranged about the room, and the green leaves are spread upon them and then subjected to a current of dry air. Next comes the rolling, which twists the leaves, breaks their cells and facilitates the process of oxidation. When green tea is required, of which there is comparatively little shipped from either India or Ceylon, the process employed is different.

The rolling being completed, the leaf is distributed in trays to undergo the entire oxidation process by exposure to the air. Then come the firing and drying, and this work is accomplished through the medium of machines, which dries and extracts all the moisture. The sifting and sorting into different grades are next in order, and then the packers take hold and the tea is ready for shipment to any and all parts of the world.

In India the various processes are similar, Ceylon having followed the lead of the former country in the use of machinery, tea having been a commercial product there long before it was thought of in Ceylon.

European capital has developed these countries, and the push and energy of the Anglo-Saxon is gradually leading the world in the production of tea. The fight will indeed be an interesting one for supremacy, if it can be demonstrated that tea may be successfully and profitably grown in this country and the English colonies will have to look to their laurels.

TEA GROWN IN AMERICA.

In this country the introduction of tea received its first real impetus at the Chicago World's Fair, although some desultory work had been done prior to that. Enterprising planters sent commissioners here, and a vast outlay of money was made, and the result attained was so satisfactory that the work has been carried on systematically since, and each year has shown an increase, the last report showing the stupendous gain of 72 per cent.

The English producer claims for his tea first that it is absolutely pure, and secondly that it is all machine cured.

The large importers of these teas into this country have been against the proposed legislation, which makes a standard that allows adulteration. They claim that the use of Prussian blue and other substances is detrimental to public health and should be stopped. Absolute purity is their aim, and it seems that they have the best of the argument when the records of every port of entry in the United

tates fail to show that a single pound was ever ejected for any cause, while it is a common occurrence for teas from other countries to be refused admission.—*Mail and Express*, July 11.

DETERIORATION OF INDIARUBBER BY KEEPING.

We are asked to publish the following copy of a letter dated the 11th May 1896, from the Reporter on Economic Products to the Government of India, to the Inspector-General of Forest, Simla:—

"Replying to your demi-official dated 24th ultimo on the subject of the Assam rubbers, I am glad to find that you underestimated them. That gives a better token of the future, than if you had gone to the other side. As to the want of uniformity in Carritt and Co.'s valuation, so much depends in the eyes of brokers on external characters, that the sample that had got a little more oxidised through more direct exposure to air than another would at once get a lower price assigned to it. It is wonderful how rapidly indiarubber in its crude state suffers. Some of our samples in the Museum have become liquids, devoid of all elasticity. This, I think, should give the practical suggestion that the sooner rubber leaves the producer's hands and is taken over by the purchaser the better. No consignments should be delayed in India."

"But besides oxidization there are many other ways by which one parcel drawn from identical trees and prepared by the self-same process will fetch a lower price. But I think the Assam Conservator told us that the samples were obtained from several recognised races of the rubber tree. So that there may be a botanical reason for the variation in the valuation. I am promised botanical samples of each form, and will, I hope, soon be in a position to express an opinion upon this feature. I hope Assam may be able to furnish us with larger samples. We could easily find willing buyers, as there is a distinct demand for Assam rubber."—*Indian Forester*.

FLOWERING OF STROBILANTHES [NILU] IN BOMBAY.

Strobilanthes callosis flowered along the Western Ghauts in the Belgaum District in 1887 and in 1895, showing an interval of 8 years. The flowers appear in the month of August but the seeds do not ripen till the following May.

Strobilanthes sessilis is very common along the Western Ghauts at an altitude of about 2,800 ft., and flowered in 1888 and in 1895, showing an interval of 7 years.

THE NYASSALAND COFFEE COMPANY, LTD.

An adjourned meeting of the Nyassaland Coffee Company, Ltd., was held at noon today in the office of the agents and secretaries (Messrs. Carson & Co.). Mr. Macindoe presided, and present were Mr. E. R. Waldock, G. J. Jameson (by his attorney Mr. Macindoe), Messrs. Carson & Company (represented by Mr. Macindoe), Mr. W. Shakespeare, and (by proxy) Mr. G. K. Deaker.

On the motion of the CHAIRMAN seconded by Mr. WALDOCK the report and accounts as appended were taken as read.

SUPERINTENDENCE.—The Directors have to report that Mr. G. Mortimer Crabbe was appointed Manager and proceeded last year to Nyassaland to take charge of the Company's land. In order to develop the Company's land it was considered advisable that two European assistants should also be sent, and Messrs. L. T. Moggridge and S. Robins were appointed. They arrived at Chinde on 15th May, 1896.

PROGRESS OF WORK.—The latest advices dated 8th May, 1896, report that 55 acres had been felled, 15 burnt and 12 holed, in addition to the 10 acres planted December, 1895. At the time of writing, Mr. Crabbe had 210 people working, and if labor continued plentiful he hoped to have about 200 acres opened this year.

SEED.—So far the Directors have been unable to procure any from Brazil but efforts are still being made to get some. At present the plants and seed have to be bought from neighbouring estates in Nyassaland.

PURCHASE OF LAND.—Only the 1,500 acres block has up to date been transferred to the Company. For the other block of 2,000 acres referred to in the Prospectus and the circular dated 7th June, 1895, a proper title has not yet been received, but it is hoped will arrive shortly.

It has been suggested to the Directors that an Estate, part of which is in bearing and which adjoins the Company's land, should be acquired. Negotiations are in progress, and if it can be bought at a reasonable figure might prove a valuable addition and enable the Company to give the Shareholders an immediate return upon their investment.

It will be necessary to elect an Auditor.

Mr. SHAKESPEARE proposed and Mr. WALDOCK seconded the adoption of the report. Agreed.

On the motion of the CHAIRMAN seconded by Mr. SHAKESPEARE, Mr. E. R. Waldock was appointed auditor for the ensuing year at a remuneration of R50 for each audit.

Meeting adjourned.

JOHN COMPANY.

Whatever may be thought of the policy of governing vast expanses of barbarism by the agency of private trading corporations, there can be no doubt this empire owes its present commercial pre-eminence in a large measure to the enterprise of the chartered companies who first settled most of the Greater Britain of today and exploited the natural riches of our colonial soil. The reign of the great East India Company, the largest corporate body the earth has ever seen, was the Golden Age of "Mincing Lane," and the rise of our Eastern drug and spice trade is directly due to the pioneering enterprise of the East India, the Turkey, the Russia, and the Cathay Companies. Indeed, it is a commonplace that it was largely for the sake of securing this trade that we first ventured in the Indian seas and fought the Dutch and the 'Portingales.'

It seems to us that more might have been made of this very interesting branch of trade in Mr. Geo. Cawston and Professor Kean's 'Early Chartered Companies,' which has just been published; but perhaps the authors required all the space at their disposal to deal with the political and economic aspects of the chartered companies from Henry III. to Charles II., and were thus compelled to restrict themselves to the smallest compass in referring to actual trading operations.

How many people are aware that there was a 'Made in India' agitation two centuries before anyone had heard of 'Made in Germany'? That is a fact nevertheless. In 1681 the Turkey Company, a rival concern of the East India Company, brought a charge before Parliament through a Mr. Polexfen—who appears to have been the Sir Howard Vincent of his generation—accusing the India Company of 'exporting immense quantities of gold and silver with but little cloth, bringing back calicoes, pepper, wrought silks, and a deceitful sort of raw silk,' the importation of manufactured goods from abroad being 'an evident damage to the poor of England.' The East India Company were further accused of encouraging manufacturing industry in India, and the same dire consequences were predicted to our home industries that are now prognosticated from German rivalry. Nobody, however, seems to have been one penny the worse in the end.

This great East India Company, which for several generations stood for the name of Britain in the East, which brought millions upon millions of money into this country, and founded an empire in Hindostan, was established by a Royal Charter of Elizabeth in 1599 with a capital of only 72,000*l*. Four years later the firs

cargo of pepper and other spices was imported into London by the adventurers 'after a prosperous voyage of two years and seven months,' and sold, no doubt, to their own exceeding profit. What gains were made on imported produce in those days is shown by Malyns in his 'Centre of the Circle of Commerce,' a contemporary work, from which it appears that the difference between the cost and the sale price of some of the Company's chief imports in 1623 was as follows :—

	Cost in India per lb. s	d	Sold in England at per lb. s	d
Pepper -	0	2½	1	8
Cloves -	0	9	5	0
Nutmegs -	0	4		0
Mace -	0	8	6	0
Indigo -	1	2		0
Raw silk -	8	0		0

What the City middlemen made in those days one can only conjecture. The mere enumeration of the figures is enough to make a modern Mincing Lane man's mouth water.

In a book dealing with the early British trade with India we naturally expect to find a reference to the now discredited poison-antidote bezoar. Mr. Cawston gives, as the derivation of that word, the Persian *pad-zahr* (lit., 'poison-expelling'), meaning "antidote." The Persians employed the name specially for the balls of silicious matter occasionally found secreted in the intestinal canal of the Persian wild goat, but the East Indian bezoar, as we now know, was mostly derived from monkeys. The popular delusion of the efficacy of the drug in the mental, as well as in physical, afflictions is shown in the line from a contemporary author, where 'the healing bezoartical virtue of grace' is mentioned.

Less accurate is Mr. Cawston's reference to 'worm-seeds,' which were among the first articles imported from India, as 'short for wormwood-seeds, the seeds of *Artemisia maritima*, still used in India as a stomachic tonic.' The seeds brought over by the early Indian traders under this name were probably the Indian variety of *Semen Cinæ*, the worm-seed which is now chiefly imported from Russian Central Asia for santonin-manufacture. The seeds of the wormwood, or absinthe plant, have no connection with them except that both plants are *Artemesiæ*. The spice-trade of the Company received a heavy blow in the early years of that corporation's activity by the expulsion of the British from the Moluccas, or Spice Islands, by the Dutch; and from that time may be reckoned the definite establishment of a competing spice and drug market at Amsterdam, which is today a serious rival to London as it has ever been before.

The long duration of the lucrativeness of the Indian trade of the East India Company is shown by the fact that in 1726 it was computed that of the Company's annual imports, representing an aggregate value of 22,000 00*l*., not less than 8,000,000*l*. was clear profit.

Tea became a trading article of the East India Company about the year 1645. It was first introduced into this country by the Dutch, and sold then at from 120s to 200s a pound. In 1660 the Company presented Charles II. with 2 lb. 2 oz. of the herb—a liberality which was probably well calculated, for shortly afterwards 'tay' became a fashionable beverage with the Upper Ten. A four-shilling duty did not prevent the spread of that popularity, and in 1745 Parliament passed an Act threatening the Company with the forfeiture of the charter if they should fail 'at any time to keep the London market supplied with a sufficient quanty of tea at reasonable prices, to answer the consumption thereof in Great Britain.'

The East India Company's monopoly of the Indian trade was abolished in 1833; but the Corporation itself survived until the Mutiny in 1857, after which it was taken over by the State—a fate that has recently also overtaken its East African successor.

It is interesting in the present day to note that the first real trading company which received a Royal charter in England was not a British, but a German, one. It was composed of traders of the Hanseatic League, who established a kind of depot in the City of London, at the place where Cannon Street Station stands now. For nearly three centuries the 'Germans of the Steelyard' were one of the most powerful corporations in England, and it was partly apprehension of their growing influence that caused Elizabeth, in 1597, to revoke their privilege and turn them out.—*Chemist and Druggist*, July 25.

THE TEA DUTY.

Some of the statements which were hazarded in the discussion on the tea duty, when in the ordinary course of business the Finance Bill came to be considered in the House of Commons on Tuesday last, are calculated to fill the mind of those engaged in the tea trade with wondering amazement; and we are not surprised that the varying accounts of what the Chancellor of the Exchequer said or did not say on that occasion caused such bewilderment that it is thought expedient for the Grocers' Federation to take the matter up and find out the real truth of the case. If Sir Michael Hicks-Beach has been rightly reported, it will be seen, on referring to another part of this Journal, that he stated in the House that ninety-five per cent. of the duty on tea was derived from leaf sold wholesale at less than a shilling a pound! To put the same fact in another way, the tea which commands a wholesale price of over a shilling is, according to the Chancellor's statement, only 1-7 per cent. of the whole; while the wholesale price of the bulk of the tea sold in 1895, varied from 7¾d. to 9¼d. per pound. Unless Sir Michael's observations are capable of some other explanation they certainly form a serious indictment against the trade, who might obviously be accused of making enormous and unfair profits on on their higher-priced teas; so that in their own interests and for the satisfaction of the public such insinuations should at once be repudiated. Fortunately there need be no difficulty in removing any false impression which may have been caused by so strange an assertion. According to official figures now before us, it is plain that in 1895 the wholesale price of tea in London ranged from 5d to 2s 6d per pound, and choice parcels brought even more money than the latter quotation. It seems evident that Sir Michael was speaking on Tuesday without his book, or he meant to say something different to what he is reported to have said. Anyhow, the trade will not be content until the matter has been fully explained. As to the various propositions which were forthcoming why the tea duty should be lessened, differentiated, or altogether abolished, we leave it to our readers to consider them at their leisure. They are all so manifestly impracticable at the present time that it seems little better than childish to have wasted many hours of the precious time at the disposal of the House in bringing them forward. With the heavy expenditure sanctioned by the Legislature to ensure the safety of this country and her vast dependencies, there is no prospect whatever of any remission of existing taxation, and the tea duty cannot be said to press heavily on any class of the community. The trade themselves are in no way desirous of a change which would cause an immense amount of trouble and anxiety with no probable adequate return. "Let well alone" is a safe motto in this instance, and one which all parties concerned will be disposed to adopt.—*Grocers' Journal*, July 11.

PLANTING OF BUCKLANDIA AMONG TEA.

DEAR SIR,—Will you be so good as to inform me through your columns as to the suitability of planting the *Bucklandia* tree for shade, timber and firewood on a Ceylon tea estate, elevation about 3,000 feet, in a dry climate, that is to say, planted in the tea at intervals and along the roads, also for timber clearing alone, on the estate. Also as to the planting out of the seed in nurseries: whether it requires any special soil or preparation of the soil for rearing plants in the nurseries.

I have never seen the seed, so have no idea what quantity (weight) to order to raise, say, 10,000 plants. Can you inform me?

Will you also kindly insert advertisement—

Wanted—*Bucklandia* seed, suitably packed, for transmission to Ceylon. State price for large and small quantity.

Some trees have a marked injurious effect on the tea, whereas *Grevillea robusta* does no injury but rathor the reverse.

I should liko to know what you think would be the effect on tea if interplanted with *Bucklandia*.

Rothschild; Pussellawa, Ceylon. W. H. HANNAM.

Note.—Perhaps some of our Darjeeling subscribers could kindly forward the required information. The *Bucklandia* seed, so far as we know it, is very small. We think it would have much too heavy a foliage and be too shady for planting in tea.—Hon. Ed.—*Indian Forester.*

THE YATADERIA TEA COMPANY OF CEYLON, LTD.

An extraordinary general meeting was held on the 15th Aug. at 12-30. Present:—Messrs. H. V. Masefield (in the chair), John H. Starey, D. Fairweather (Directors), B. G. L. Bremner, Secretary; C. M. Gawtkin and J. A. Martin, and by attorney O. H. Warren, W. W. Church and A. H. Dingwall.

The Secretary read the notice convening the meeting. It was proposed by the Chairman and seconded by Mr. J. A. Martin:—"That an ad-interim dividend of 12½ per cent for the half-year ended 30th June 1896 as recommended by the directors be declared and made payable forthwith."

The Managing Director, speaking to the resolution, said that first of all he had to point out a misprint in the last annual report where the cost of the tea for 1895, including everything, was stated at 25·9 cents instead of 20·51 cents per lb. This error did not affect the accounts or results in any way. Up to 30th June last about 46 per cent of the crop estimate for the year had been secured, while pruning was rather in advance of last year. He had visited the estate this week and had found it in good order, and managed with the usual good care. Rather finer plucking is being tried.

After a few questions had been answered the Resolution was put and carried unanimously.

ST. HELIER'S TEA COMPANY, LTD.

A meeting of the shareholders of this Company was held in the office of the agents and secretaries (Messrs. Bois Bros. & Co.) on the 15th Aug. The Directors' report, which is appended, was adopted and its recommendations given effect to:—

The Directors herewith have the pleasure to submit their Fourth Annual Report, which, they trust, will be considered satisfactory by the Shareholders, shewing, as it does, a nett profit of about 26 per cent on the year's working.

The crop, which was estimated to be 95,000 lb. of made tea to 30th June, has turned out 98,371 lb., and has realised an average price of 45·88 cents per lb.

The cost of the tea in Colombo, exclusive of the sum of R952·22 expended on a new clearing of 29 acres, works out at 21·01 cents, shewing a margin of profit of 21·84 cents per lb., which may be looked upon as very satisfactory.

The total acreage under tea is now 226 acres in bearing, 21 acres 1 year old, and 29 acres being planted.

The Directors make the following recommendations:—

That a final dividend of 15 per cent should be declared, which, with an interim dividend of 10 per cent already paid, makes a total for the year of 25 per cent leaving the sum of R887·57 to be carried forward to next account.

Mr. Stanley Bois retires from the board by rotation; but, being eligible, offers himself for re-election.

The shareholders will also have to elect an Auditor for season 1896-97.

INDIAN PATENTS.

Applications in respect of the undermentioned inventions have been filed, during the week ending 25th July 1896, under the provisions of Act V of 1888.

Improvements in apparatus for packing tea or other substances. No 255 of 1896.—Samuel Cleland Davidson, merchant, of Sirocco works, Belfast, Ireland, for improvements in apparatus for packing tea or other substances.

Improvements in the manufacture of tea chests.—No. 256 of 1896.—John Coryton Roberts, planter, of 16, Cromwell Grove, West Kensington, in the county of London, for improvements in the manufacture of tea chests and other packing cases or boxes.—*Indian and Eastern Egineer*, Aug. 8.

INDIA AND CEYLON OUSTING JAPAN TEA.

As already mentioned in these columns, the depression in the tea market has resulted in many tea-growers resolving to abandon this year the picking of second crop leaves. Such a resolution on the part of manufacturers is said to be inevitable, for present quotations really entail loss. A report forwarded from a district in Shizuoka in the middle of last month to the Central Guild in Tokyo, puts the situation thus:—

ESTIMATED COST OF MANUFACTURE PER KWAMME.

	Sen.
Raw leaves, 4 *kwamme*	792
Pickings expenses	372
Cost of curing	680
Total *yen*..	1·821

Tea of a given quality is now quoted at 1·50 *yen* or so, hence in manufacturing one *kwamme* of this tea, manufacturers are actually losing ·321 *yen*.

In a previous issue we noted how markedly the quantity of tea exported has fallen this year compared with last season. The *Kokumin* says that the attention of the authorities has been drawn to the matter, and they have caused inquiries to be made into the subject. According to their investigations, one of the causes that has resulted in the diminution of export is believed to be the over-abundant stock held in New York and Chicago. Another is the gradual encroachment in the American market of the Indian teas. British tea-merchants in India are sparing no pains to push their product in America. In the press, in social conversation, and in almost every conceivable way, the British-Indian merchants are speaking ill of Japanese tea, and are doing their utmost to expel it from the markets of America. Japanese tea-men are entirely indifferent to, or ignorant of, these things. The moment they deliver goods to resident merchants in Yokohama or Kobe, they consider their interest closes, and they do not even take the trouble to ascertain the destination of their goods, or whether they are favourably received or not in foreign countries. Under the circumstances, the gradual ousting of Japanese tea by Indian in the markets of America is not strange. Another point which Japanese tea merchants and manufacturers ought to bear in mind, is this. They must distinctly understand that cheapness is the only quality that recommends Japanese tea to American consumers. Therefore, when Formosan or Indian tea, which generally command higher prices in the American market, can be sold as cheaply as Japanese tea, the middle and lower classes of America, the principal buyers of Japanese leaf, at once transfer their patronage to the products of India or Formosa. In this repect, Japanese tea-growers are placed in a very painful situation this year, for while the cost of production has risen considerably, market values have moved in a contrary direction. Any temptation towards deterioration in quality must be resolutely faced, otherwise Japanese tea will be speedily driven from America by its Indian and Formosan rivals, and then its fate will be sealed. The prospect of the election of Mr. McKinley as President of the United States, must place Japanese tea-growers more on the alert, for, with his election and the imposition of a higher protective tariff, the inspection of imported tea will become more stringent.—*Japan Weekly Mail*, July 11

PURE MACHINE-MADE TEAS.

INTERVIEW WITH MR. R. V. WEBSTER.

There sailed from this port on Saturday last a presentative planter of Ceylon, Mr. R. Valentine Webster, of the Ceylon Tea Gardens Company, of Colombo, Ceylon (formerly known as Ceylon Co-operative Tea Gardens Company), and through whoso eourtesy we are permitted to present some facts of general interest about Coylon and its greatest and most prosperous industry. Mr. Webster, called by many the "Prinee of India," on account of his travelling all over the globe in the interest of Britsh grown tea, states as the result of his s x years' experionee that Ceylon and India teas are steadily gaining favor with eonsumers in all tea using eountries.

"Within six years," said Mr. Webster, "India and Ceylon teas have come into general use in Australasia, New Zealand, South Africa, the West Indies, Egypt and Canada, while there is an increasing interest manifested in Ceylon and India teas in France, Spain, Italy and in Russia, which takes the higher grades. Australasia takes the cheaper grades and thereby makes a great mistake. It is folly to attempt to bring Ceylon and India teas into permanent favor unless it is by eultivating a demand for the high grades of tea.

"Four years ago, during my visit to the United States, I could get nobody to listen with patience to my advoeacy of Ceylon tea, either in bulk or packets. Your dealers claimod that the United States was a user of green tea, and therefore would never take kindly to machine-made teas. I explained that other eountries which had been partial to green teas had made the ehange and that I could see no reason why the United States should be an exeeption. This, they claimed, was because other countries had beon using Oolong tea and not Japan and China greens, as was the case in this eountry. I maintained, however, that the United States was the only exeeption in the world, and that within three years the United States would be importing large quantities of Ceylon tea; that Ceylon conld manufacture underfermented tea in obedience to the demand of the American market quite as readily as it could change the character of tea to meet the reqnirements of London. My prediction has come about and in short time. Why, last year the sales showed an increase of 72 per cent. over 1894, while up to date this year my company alone has sold four times the amount of tea that it did last year, and tho general demand is steadily enlarging.

"I would remind my AmerIean friends that in Ceylon and India two distinct varieties of tea are made, the one, "mild flavored," is grown on the higher elevations, and where tea is produced better suited to the American market than the stronger, more pungent teas grown on the lower elevations, which are better adapted to the English, Irish, Australasian and Canadian markets. But I would remind you that America is not the only country which goes in for these light-liquored teas, for in Italy, France, Egypt and Germany they are preferred to the heavier bodied teas so popular in the United Kingdom.

"I have been frequently asked by people in the States whether I ean send samples of first crop of Ceylon teas. Now, there is no such thing as first erop of Ceylon tea. Ceylon is only four degrees—or, strictly speaking, three and a half degrees—north of the equator, where we have perpetual summer, and pick tea all the year round. In Assam, in the northern part of India, tho tea plants do not 'flush' (tea planter's term for sprouting) during the winter. There they begin to pick tea about May 1st and keep it up till about January 1st. The 1896 crop of India tea will be on the English market this month."

In reply to the query if it were possible for Indian planters to manufaeture a grade of tea similar in character to that now largely used by American people, and to maintain uniform grades year after year with tea from the same gardens, he said

"Yes, it is possible, and wo can so manufacture it that it will keep good and in sound condition. If any of your tea jobbers in the United States would like to secure any particular style of tea, I would be very much pleased if they would send a sample to the Ceylon Tea Gardens Company, Colombo, Ceylon, and if it is not possible to procure it from tea grown on its estates, I will advise them where it can be procured.

"There are teas grown and eured on certain estates that vary very much from season to season. This is partly due to the manager changing the make of his teas to suit the demand of the London market. There are certain companies that only go in for standard teas, and do not study carefully the peeuliarities of the various markets of the world. I unhesitatingly state that dealers can procure a standard grade of tea in Ceylon and India, if they will take the trouble to find the parties. The variation in rainfall, or changes in the soil, have very little effect on the products in any garden. Whatever variations ocenr are; chiefly due to changes in the process of curing and attempts to meet instructions from London faetors.

"During my present visit to New York I eame across a sample of tea from my own estate, in a one-pound packet, which had been two years in this country, and the flavor of which was fully as good as when it was paeked, thus demonstrating that Ceylon teas, when properly fired, will keep. The underfired teas of Ceylon are like the underfired teas of Japan and China, and will not keep their flavor for any considerable length of time.

"I feel satisfied that when Ameriean eonsumers beeome adepts in the use of straight Ceylon and India teas, they will use no other. They have yet to learn that it is three times the strength of China and Japan leaf. Our greatest troublo has been to teaeh eonsumers to use much less in making an infusion than they have been aceustomed to of other sorts. When they becomo convinced of the great saving to be made by using machine-made teas, I feel eertain that these will take precedence over China and Japan sorts, and challenge the supremacy of coffee as the favorite beverage. It is at present a campaign of edueation, and it is making gratifying progress, and is destined to make rapid and wonderful strides in popular favor.

"At the present time Ceylon is enjoying a period of marked prosperity, ehiefly through its tea industry, which has made its way into all parts of the world. The coconut industry is a large and profitable interest. A large bnsiness has grown np in desiccated coconut. The present export of tea from Ceylon is 103,000,000 pounds, and I look for an increase to 140,000 pounds, which may prove the limit. In India there is a large area suitable for tea cultivation, but want of labour will restrict the very rapid extension of the tea industry in that country. In Ceylon labourers on the plantations reeeive 8 cents per day, and on this they subsist, getting all that they need in the way of food and clothing, with something to spare for trinkets, of which the natives are very fond, particularly the young women. Those working on the estates live principally on riee, which they cook with eurry and herbs, and are quite eontent."

We made bold to refer to Ceylon's having the silver standard, and asked Mr. Webster as to its bearing upon its position. He said:

"Yes, we have a silver standard and I would dislike to have it ehanged. It enables Ceylon to compete for the markets of the world. The rupee has fallen in value, so that measured by gold it is only about half its former value, but the rupee buys just as much in Ceylon as ever. There has been an advance in labour, but this is due to an increasing domand. Many of the natives are averse to working on the estates, preferring life in the towns. If rice has advaneed the rise is due to other conditions than any change in the value of the rupee. Were the value of the rupee to rise to its par, we could not raise our products and get them into the markets of the world. I believe the silver standard is best for Ceylon, just as a proteetive tariff is for the best interest of the United States, or a tariff for revenue is best for the United Kingdom."

Mr. Webster is also the pioneer coffee planter of Australia, where he started the first coffee plantation in Queensland, in 1895, where climatic conditions are favourable to the growth of Coffee Arabica and where his experiments for the past four years have been very promising.—*American Grocer*, July 15.

[The above article is accompanied by an excellent portrait of Mr. Webster seated in a drawing-room and enjoying a cup of tea.—ED. *T.A.*]

OUR NEW CEYLON.

It is most satisfactory to note that the Ceylon papers seem satisfied that British North Borneo will, before long, become a coffee-growing country, and are now willing to give it the advertisement of favourable notice in this respect. This is no doubt owing to the fact that two of our coffee growers, Messrs. Henry and E. R. Walker—unconnected by relationship, but having the common bond being ex-Ceylon planters—have both been successful. Their reports have so thoroughly confirmed the reality of the results obtained on the Development Company's estates that any lingering doubts seem to have disappeared ; and the wise policy of the Court in the matter of free grants for experimental purposes—if indeed 500 acres can be termed only an experiment—will, it may be confidently anticipated, produce before long most satisfactory results.

Mr. H. Walker drew the attention of his Ceylon friends to one important point—the absence of those high winds in British North Borneo which prevail during the monsoon in the Spicy Island. But he might have alluded to another matter of not inferior importance—the non-appearance of any fatal form of blight. Here and there, at the Byte for instance, an occasional tree will be found with a few of the lower leaves showing something like the black spotted appearance so dreaded by coffee planters. But, oddly enough, these appear not only to have had no effect upon the bearing of the individual trees but have never spread. The general opinion therefore is that this is not the blight which has occasionally proved so disastrous elsewhere. Such trees, moreover, have to be looked for and do not catch the eye of the casual observer. After some years' experience, therefore, the manager of the estate in question considers himself justified in stating that blight is unknown.

Considering the success that has been achieved by the adoption of hand-pulping only, the introduction of proper machinery will probably give a vigorous spur to the industry. Mr. Walker does not, we observe, allude to this. He lays much stress upon the necessity of roads to and through the coffee-growing districts, and with this opinion everyone will concur. But it would be impossible, with the small staff at the disposal of the Government, for it to undertake such work in isolated localities. The solution of the local question—the Government making and up-keeping the trunk roads—will probably lie in some form of assistance being given to planters whose selections are outside the main routes, either by additional grants of land or otherwise. Mr. Walker states that Dusun labour can be obtained in Membakad district at about 16 cents a day—a boon for which Sandakanites would be devoutly thankful ! At this figure, at all events, road-making would not be a very expensive undertaking. The Dusun is undoubtedly impatient of fixed hours for labour. He likes to go to work and leave off at his own time, but will work well enough when disposed to accept employment. The best way is to contract with responsible head men, taking care never to let the contract be broken without the exaction of an ample penalty. The bane of the labour market hitherto—especially amongst wood-cutters—has been the payment of large advances to the labourers. This can be avoided when they are recruited upon the spot, and have not to be induced to leave a settlement for the jungle. One reason for the success of the Byte, for instance, has been the fact that the employes are free settlers on the ground around the plantation.

Mr. Walker's estimate for bringing coffee into bearing is ten pounds sterling (say $90 roughly) per acre and the estate seems a fair one if it includes all expenses of management. Mr. Pryer's estimate for 400 acres up to 36 months (when a fair crop may be expected), was $35,965 which also gives between $89 and $90 (these figures appeared in the *Herald* of 1st Dec., 1894) so that the estimate is probably as near the mark as estimates are likely to be. But the latter gentleman is most careful to explain that this result can only be looked for if a supply of cheap labour can be relied on. Weather, too, has an important effect on the preliminary expenses of cleaning and burning. A wet season costs much more than a dry season ; but, taking one year with another, his figures seem fairly correct. It would be interesting to know how these compare with the Ceylon expenses.

One other point may be referred to—the saleable price of the parchment berry as delivered in Sandakan, compared with its actual cost of production. In the *Herald* above quoted Mr. Pryer puts the figures for estates in this neighbourhood as $5 and over $25, or *five hundred per cent* profit. Such figures could not of course be taken to represent probabilities as regards estates in the interior, or even near the sea where transit facilities are less available. But they may serve to indicate to our Ceylon friends the fact that "there is money" in judicious Borneo estate investments. We have an object lesson in Klang as regards too hurriedly considered enterprise, and it is not likely to be ignored by any sensible prospector. But given suitable soil and the existence of a fairly cheap labour supply, there is no reason why numerous coffee growing centres should not be established in the Territory.—*British North Borneo Herald*, July 16.

PLANTING AND PRODUCE.

THE "BOOM."—In financial circles the "boom" in new tea companies is attracting considerable attention, and pious wishes are expressed that tea company promoting will not be overdone. It is usually safe to be pessimistic and to be wisely critical about popular tendencies. So long, however, as there is a plethora of money and an absence of "gilt edged" securities except at prohibitive quotations the public will seek an outlet for their spare capital. Joint stock enterprise therefore is rampant, and we wish that one half of the projects now seeking capital offered as reasonable a prospect of remuneration to the investor as tea companies. We do not say that every new tea project offered to the public is likely to prove a source of profit. Investors must use their judgment in the selection and endeavour to gauge the position for themselves. The tea industry is a genuine British enterprise which was up to a year or two ago suffering neglect at the hands of the investor. It is now in a fair way to loom large in the financial world, and some of the promises made on its behalf may not pan out, but for all that the industry is in a healthy state, and there is no need

to drop teas over it yet. If the demand for tea falls off and the supply increases, it does not require a sage to tell us that the outlook will be less pleasant. All industries are subject to vicissitudes and the prophet will always find plenty of wilderness to cry in. There is at this stage no special occasion to decry tea, or to lament that wisdom has gone from us, because the public are making up for lost time by showing a disposition to rush in where they formerly feared to tread. There is a limit, however, to the development of tea enterprise unless new markets are opened up, and it is but natural that some of the proprietors in the older concerns should view with apprehension the increase of new ventures. Certainly the activity in the bringing out of new companies should lend aid to the work of finding an outlet for the increasing output of tea which will sooner or later result.

An Old Story Re-Told.—It is historically useful to learn from the official "Statement exhibiting the Moral and Material Progress and Condition of India during the year 1894-95"—the year, that is, ending on March 31, 1895, that the tea exports were increased by Rx970,000 in value, and most of them came to the United Kingdom. It is noteworthy that while we took 93 per cent of our tea from China in 1865, and only 2 per cent from India, and not so much as 1 per cent from Ceylon, in 1895 we took 46 per cent from India 32 per cent from Ceylon, and only 16 per cent from China. The importations from China have steadily dwindled.—*H. and C. Mail*, July 31.

INDIA AND CEYLON TEAS.

From the well-known "T. A. C." we have received a profusely illustrated copy of the Sunday edition of the *New York Herald* containing the following parody in the shape of an appeal to buy India and Ceylon Teas :—

Portia :—The quality of those teas is not strained,
They are pure as gentle dew from heaven,
They are twice blest; both blessing him who sells,
And her who buys;
Bring bliss to her who pours and him who quaffs,
They're purest of the pure.

The advertisement is accompanied by an illustration of *Portia* in gown and trencher sipping the fragrant beverage.

BURNSIDE TEA COMPANY OF CEYLON, LIMITED.

The mail has brought us a copy of the prospectus of this Company which has just been formed with a capital of £50,000, in 5,000 shares of £10 each :—

Issue of 1,400 Shares of £10 each—£14,000; and 5 per cent Debentures—£7,000 :—£21,000.

Besides the above-mentioned amounts, 600 fully-paid Shares will be issued to the Vendors of Burnside and Midlothian Estates on account of purchase-money. The total issue at present, therefore, will be 2,000 Shares out of 5,000, and £7,000 Debentures.

It is not intended to call up more than £5 per Share. The remaining £5 per Share, total £7,000, will be specifically charged to secure the Debentures, the amount of which is limited not to exceed the uncalled Capital of the Company for the time being, and which will be furthar secured by a floating charge upon the other property of the Company. The Debentures carry Interest at 5 per cent. per annum, and are payable on 31st December, 1901.

Subscriptions for the £7,000 Debentures are payable :—10 per cent. on Application and the balance on Allotment.

They will be issued for sums of £50 or multiples of £50 each. The Interest upon the Debentures will commence from the date of Allotment, and the first payment will be due on the 1st of January, 1897.

Directors.—George William Paine, Cotswold Lodge, Upper Norwood (Chairman). Sir George Augustus Pilkington, Belle Vue, Southport. Robert Porter (Midlothian Estate, Ceylon), 37 Chalmers Street, Edinburgh. George Gray Anderson (Lyall, Anderson & Co.), 16 Philpot Lane, London, E.C.

Bankers.—The National Bank of India, Limited, 47 Threadneedle Street, E.C.

Solicitors.—Murray, Hutchins, Stirling & Murray, 11 Birchin Lane, E.C.

Auditors.—Cape & Dalgleish, 8 Old Jewry, E.C.

Ceylon Agents.—Whittall & Co., Colombo.

Secretaries and Office.—Lyall, Anderson & Co., 16 Philpot Lane, E.C.

This Company has been formed primarily to purchase the following Estates :—

Burnside, situated in the District of Rangalla, Ceylon, from Messrs. Robert and George Porter and the Rev. A. R. Cavalier.

Heeloya also situated in Rangalla District, from Messrs. Matheson & Co.

Midlothian, situated in the District of Maskeliya, from Mr. Robert Porter.

Burnside and Heeloya Estates have been secured at prices approved by Mr. Joseph Fraser, of the Pitakande Group, and Midlothian Estate has been purchased at the figure placed upon it by the Vendor, Mr. R. Porter.

The following statement is based upon information received from the Vendors :—

Burnside Estate consists of 178 acres in all, and the elevation is 4,000 to 4 500 feet. According to the Ceylon Directory it contains :—

100	acres Tea in full bearing.
24	,, young Tea.
54	,, Forest.
178	acres.

There is a permanent Factory with a Water Whee and sufficient supply of water, and a Simplex Roller and Sirocco Drier.

There is a small Bungalow with several sets of lines. A new permanent set has just been built.

Heeloya Estate.—The acreage is as follows :—

380	acres Tea in full bearing.
10	,, Planted in Timber.
30	,, Grass.
40	,, Waste Land, &c.
460	acres.

The Factory is very complete, with two Rollers, two Driers, Tea Sifters, &c., and there is a Water Wheel with abundant Water-power.

The yield of Tea on Heeloya is not so satisfactory as it might be, but the soil is good; the bushes taken as a whole are well grown, and in Mr. Fraser's opinion the Tea would respond to cultivation as well as it has done on the Pitakande Group, and it is the Directors' intention to follow the system so satisfactorily adopted by Mr. Fraser on the Estates named.

Midlothian Estate lies between the well-known Ormidale and M[illegible] Estates, at an elevation of about 4,500 feet.

It is about two miles from the Cart Road, and can be easily manured.

The acreage is :—

	170	acres	Tea in bearing.
	40	,,	,, 3 years old (coming iuto bearing.)
	30	,,	,, 2 years old.
	240		
Say	4	,,	Planted in Timber.
	244	acres.	

There is at present no plan of the Estate, and these acreages are therefore approximate.

The young tea is fine Jât from Mount Vernon and Brunswick seed chiefly, but some of the old tea is not very good Jât, and the worst bushes are being replaced with fine Jât plants.

There is a permanent Factory with a 30-ft. Iron Water Wheel, 3 Rollers, a Double Desiccator, a Tea

Sifter, and a Roll Breaker and Sifter, and the accommodation and Machinery are fit to turn out 100,000 lb. of made tea per annum.

The Bungalow and several sets of Lines are permanent.

CROP.—The estimates for the current year are:—

Burnside	..	36,000 lb. made tea.
Heeloya	..	80,000 " " "
and 80 maunds of tea seed.		
Midlothian	..	60,000 " " "

The Estates will be taken over as from 1st July, 1896, and the prices agreed upon for the properties are:—

Burnside	..	..	£2,000
Heeloya	..	..	5,250
Midlothian	..	..	10,000
			£17,250

The Vendors of Heeloya are to be paid in cash, but those of Burnside and Midlothian accept payment half in fully-paid Shares of the Company and half in cash; and Mr. R. Porter, the Vendor of Midlothian, guarantees a return on that Estate for the first 18 months at the rate of 10 per cent per annum.

THE KINTYRE TEA ESTATES COMPANY.

DIRECTORS.—G. A. Talbot, Esq., 21, Mincing Lane, E.C. (Director Ceylon Tea Plantation Company, Limited); A. A. Baumann, Esq., 109, Queen's Gate, S.W. (Chairman, Consolidated Trust, Limited, and Oceana Minerals Company); William Nevett, Esq. (Messrs. Nevett, Oswald & Co., 130, Fenchurch Street, E.C.).

SECRETARIES AND AGENTS.—Messrs. Nevett, Oswald & Co., London; Messrs. George Steuart & Co., Colombo.

VISITING AGENT IN CEYLON.—E. S. Grigson.

PROSPECTUS.

This Company has been formed to acquire as going concerns, three Tea Estates, situate in Ceylon, and known as the Kintyre Estate, the Eltofts Estate, and the Ayr Estate.

The three estates will be acquired by the Company as going concerns, as and from the 1st day of July, 1896, and will include all live and dead stock thereon as of that date.

It will be seen by reference to the enclosed reports that the crop for the current year is estimated at 400,000lb. of made tea, showing a probable surplus on the season's operations of £5,800 sterling.

After providing therefore for interest on the Preference Shares and Directors' fees the balance should be sufficient for a handsome return on the ordinary shares and in view of the fact that there is another 90 acres of young tea coming into bearing it may be hoped that the profits of the Company will improve.

Mr. Grigson considers that the Kintyre and Eltofts Estates rank among the best estates in Ceylon, as being producers of fine quality teas; he reports that the Ayr Estate is a first-class low country property.

The terms upon which the Company acquires the three tea estates from the vendors, are incorporated in three contracts, bearing date respectively the day of , 1896, one made between Horace Drummond Deane of the one part, and this Company of the other part, another made between John Geoffrey Fort of the one part, and this Company of the other part, and the other made between Emily Isabella Gibson of the one part, and this Company of the other part. These contracts provide for the purchase price being £62,000, payable £2,000 in Preference Shares, £22,000 in Ordinary Shares, and the balance of £38,000 in cash.

After payment of purchase money this issue will provide £3,000 available as Working Capital, and for further purchase of land as opportunity offers.

The Preference Shares will be entitled to a Cumulative Dividend of five per cent per annum, which will take priority, both as regards Dividend and Capital, over the Ordinary Shares.

It has been arranged that Messrs. Nevett, Oswald & Co., shall act as the London agents of the Company, receiving the usual mercantile commission of 2½ per cent on sales, and which commission covers office room in London, and the necessary clerical staff to do the work of the Company in England. The agents in Ceylon will be Messrs. George Steuart & Co.

No promotion money has been or will be paid.

There are numerous Trade Contracts in existence, and the subscribers will be held to have notice of such contracts, and to have agreed with the Company as Trustee for the Directors, and other persons liable, to waive any claims against them for not more fully complying with the requirements of Section 38 of the Companies Act, 1862.]

NOTES FROM OUR LONDON LETTER.

LONDON, July 13.

We had hoped that for some time at least there would be an interval of rest from fresh application to the public on behalf of

NEW TEA COMPANIES.

There is a very general feeling here that the thing is being overdone. Not only every week, but nearly every day, the daily and other papers contain advertisements of fresh companies prepared either for India, Ceylon or for both countries combined. The *Saturday Review* and several other leading papers have been of late giving expression to the tired feeling—one might almost say the "bored" feeling—with which these oft-repeated advertisements are regarded. There is a very generally expressed opinion that ere very long these applications for public subscription will fall very flat on the market, and that the fact will have an injurious effect upon the public confidence in the future of the tea enterprize. And the conclusion will certainly be drawn that there must be something hollow in in it when such a large proportion of private proprietors are hastening to disburden themselves of their holdings. But apparently the end is not yet. We have just received the prospectus of

"THE BURNSIDE TEA COMPANY OF CEYLON,"

the subscription lists for which were to close yesterday. Of this prospectus a copy is sent you with this. You will see that it proposes a capital of £50,000, of which £21,000 is to be first issued in ordinary shares and debentures, the interest payable on the last being experimentally reduced to five per cent. The ruling rate of these with other tea companies has been six per cent, and even that rate has not proved in all cases to be sufficiently attractive. The board of direction embraces names that will be well-known to you in Ceylon, Messrs. Whittall & Co. being the Ceylon agents, and Messrs. Lyall, Anderson & Co. the secretaries. The estates to be acquired are "Burnside" in Rangala, "Heeloya" in the same district, and "Midlothian" in Maskeliya. £2,000 is to be paid for the first of these, £5,250 for the second, and £10,000 for the third. It yet remains to be seen if the Burnside Company will be the first to illustrate the feeling referred to above that these tea companies are being overdone. We are by no means confident that it would not be better for Ceylon in the long run if some check were experienced in the floating of these innumerable tea companies.

Recent letters of this series have mentioned the dispute as to the title of

THE INDIA AND CEYLON TEA COMPANY.

The following letter addressed to the *Times* explains the nature of the error committed with respect to this. We do not quite understand, however, how a title could be provisionally

accepted for the registration of a company. If it be legal to do this, there must manifestly be some degree of uncertainty as to the permanenee of the name of any of the many companies that are daily floated. Anyway it seems a very extraordinary circumstance that a name should in this case have been selected which was manifestly open to the objections raised by the older company.

INDIA AND CEYLON TEA COMPANY (LIMITED.)
TO THE EDITOR OF THE TIMES.

Sir,—The above name was selected by my company as indicating the position of the company's properties, and was provisionally accepted by the Registrar of Joint Stock Companies at Somerset-house. As soon as it was known that objection was taken to the name on behalf of the East India and Ceylon Tea Company (Limited), we instructed our solicitors to arrange for an alteration of the name, and, with the approval of the Registrar, we have now altered the original name to—

Empire of India and Ceylon Tea Company (Limited)

Yours faithfully,

H. F. Turner, Secretary, Empire of India and Ceylon Tea Company (Limited), 60, Gracechurch-street, London, E.C.

July 24.

"HIGH-CLASS TEAS."

The following letter, addressed to our "senior" at home, will be read with much interest by all concerned in the prosperity of our tea enterprise :—

Analytical Laboratory, 79 Mark Lane,
London, E.C., July 29th, 1896.

I was very much pleased with your interesting editorial on High-class Tea and think the practical remarks which it contained should be highly appreciated by planters, as well as by all holders of shares in tea companies.

I fully appreciate the kind reference to the numerous letters which, since my first official visit in 1877, I have contributed to the pages of the *Ceylon Observer.*

It is a satisfaction to myself to see that my suggestions respecting the importance of chemical investigation into the various operations involved in the manufacture of tea, are at last authoritatively recognised.

If the various processes which the leaf undergoes from the time of picking to the time of packing are to be carefully and scientifically investigated, the inquiry must be *locally* carried on at the tea factory.

No great expense need be incurred : a junior assistant well qualified in general Organic Chemistry should be attached to each factory, and a careful inquiry instituted into the original composition of the fresh leaf as received from the pickers, and subsequent analyses should be made of the leaf during the various stages of manufacture.

The making of good tea is no doubt an art, but the various processes through which the leaf passes are controlled by chemical principles, and it is most important to ascertain on the spot to what extent the several processes may be varied with advantage.

Of course soil, season, and elevation will materially affect the general character and quality of the tea, in the same way that wine varies according to the locality and season.

It is, however, most important that the manufacture should be aided by chemical knowledge, and the future success in manufacture will doubtless largely depend upon the ability and practical skill with which chemical knowledge is applied.

As regards manuring I think that Dr. Voelcker, in his remarks following Mr. Christison's lecture, was misinformed in stating that "there appeared to be an absence of knowledge upon points of cultivation, for example, as to what manure should be used and what should be avoided in order to produce the best tea."

I believe *experienced* planters do know something definite about manuring tea by this time.

At all events I have letters by me giving very satisfactory reports of certain manures of definite composition which have been used on soils of known composition, with such favourable results that fresh consignments have been sent out at regular periods.

You are aware what a number of samples of soil from Ceylon estates were submitted to me for analysis during my official visit in 1877, and since then numerous other samples have been sent year by year.

Having carefully analysed the soil, and with a knowledge of the requirements of tea derived from numerous analyses, it is *possible* to compound a manure that shall under favourable seasons yield a satisfactory and economical result.

Planters are in this respect already availing themselves of the aid that Chemistry can afford in the preparation of fertilisers suitable for tea, and will doubtless do so more fully in the future.
—Yours faithfully, JOHN HUGHES.

CITRONELLA GRASS CULTIVATION.

Since the late boom in the price of citronella oil the Sinhalese in the Galle District have gone in extensively for the cultivation of this grass. Plantations are springing up daily in Gangebodde Pattu, Akmimane and Talpe Pattu. The area under cultivation last year in Galle was according to Mr. Elliott's Administration Report about 1,500 acres, which will no doubt be materially increased by the operations of the current year.—*Cor.*

COFFEE IN COSTA RICA.

Costa Rica has long been noted as an important coffee-growing country. In our latest summing-up of the Coffee Production of the World, Costa Rica is put down for a total export of 325,000 cwt., and the crop has ranged between 300,000 and 400,000 cwt. for some time. It is evident that there is room in this State, as in other Central and South American States, for a large expansion of the area under coffee, but two, if not three, factors operate in delaying this process :—(1) the limited and uncertain labour supply, (2) the difficulties and costliness of transport, and (3) in some cases the want of settled government. As regards the last it is of interest to learn from Mr. J. L. Shand—who has been over to report on Costa Rica coffee lands—that there is no prospect of trouble in the State under review ; while he considers the two other obstacles may also be overcome in respect of the large enterprise which has been the subject of his inspection and report. In the first place it is worth noting some respects in which Costa Rica and the Ceylon hill-country may be compared. They do not differ much in latitude, both on the north side of the Equator—Ceylon about seven and Costa Rica ten degrees north. The hilly country may be said to lie between two seas or oceans, and rises in both cases to 7,000 or 8,000 feet at the highest ; and although full and reliable meteorological returns are wanting for Costa Rica, the seasons seem wonderfully to agree in both countries : the dry season in both being from January or February till May, the rest of the year wet with occa-

sional dry intervals in August or September. In some parts the rainfall, must be more abundant in the far West State, for Mr. Shand speaks of one extensive forest-covered plain in the Concession he went to report on, which he compares to the Dumbara Valley—a thousand feet above sea level—but with 150 inches of rainfall. And this brings us to the one great factor on which the two countries differ: the far richer soil and consequently bigger forest, larger and stronger coffee bushes or trees and immensely superior coffee crops per acre, gathered in Costa Rica. On this point there can be no mistake; all evidence goes to show such returns up to a ton or two tons of coffee per acre (from limited areas) as fully justifies an estimate of 15 cwt. per acre average over no less than 1,500 acres, which it is proposed to open and plant on the Concession Mr. Shand has inspected. For ourselves, who have never seen Costa Rica—and with the question of sufficient labour to be considered—we should have been ready to put the estimate down at 10 to 12 cwt.; but the return, as estimated, shows so large a margin of profit—the estimates being by mercantile men who have another independent report besides Mr. Shand's to guide them—that, even if half were taken off, there would still be ample justification for going on. Then, as regards the mode of planting, cultivation, harvesting and especially of preparation, it is interesting to learn that Mr. Shand does not really think there is much to be taught the Costa Ricans. The Ceylon system of clean weeding is quite inapplicable. The soil is so rich as to bear any strain put on it. From 300 to 400 coffee trees per acre are enough to yield the crops spoken of: and to clear and help up the earth for a limited space round each tree seem quite enough. In preparing coffee, especially, the people with the aid of "Gordon Pulpers" chiefly—the late John Gordon at one time had a factory in Kandy,—extensive stores and barbacues (all called "beneficios") excel, Costa Rican coffee selling up to 107s. per cwt. The great difficulty is in the "harvesting" —since, owing to the scarcity of labour, there is only, as a rule, one "plucking" when ripe and unripe cherries are all pulled off together, so making the outcome often very unequal. In this direction there is room for reform if only the needful number of "hands" can be got. It is surprising to learn that the native Indians do no work on the plantations, only the Costa Ricans who pride themselves on being pure Spaniards; and the President and his Government are very anxious to have more Europeans —poor Spaniards or Italians—introduced and settled in the country, to develope coffee lands while supplied with huts or cottages and gardens for their own use.

So far, the part of the country chiefly planted with coffee has been that called "The Interior" surrounding the capital, San José, and alongside the railway. In many places such gardens or fields have been used up so far as coffee is concerned; and then the trees are pulled up, grass or jungle encouraged for a few years, and then sometimes coffee planted again. But Mr. Shand found also a good deal of the old coffee country yielding such poor results, that it is thought very likely the people working on it would be glad to be transferred to the Sarapiqui Concession, where they could earn more and be better off.

Pending the publication of the reports referred to, and the Prospectus of the Sarapiqui Estates Company—which is likely to be supported by several Ceylon men in London—we need not enter more into detail. The Company is to have a capital of £120,000 and deals altogether with a Concession exceeding 22,000 acres, most of it magnificent forest-land for coffee, and running from 1,000 to 7,000 feet above sea-level. Cacao, sugar, bananas and tobacco are spoken of as subsidiary products; but it is possible subsidiary separate companies may be formed for these. In respect of saving of labour, "spouting" (or "flumes" as locally known) is likely to be largely used in Sarapiqui; and no less important may be the utilisation of river carriage to bring the crops to the sea, boats already plying for a considerable distance.

We have said enough, however, to show that the Sarapiqui Company, established in London, to develope coffee in Costa Rica, is likely to be an important, and we trust, for the sake of enterprising countrymen taking it up, a very successful undertaking. Ceylon can have no jealousy in respect of "coffee-growing"; while there is no chance of "tea" being entered on (profitably) in any part of the Americas.

THE NEW DUTY ON COCOA-BUTTER.

On Thursday last the House of Commons, after a short debate, but without a division, adopted the following Government motion:—"That the duty of Customs now payable on cocoa or chocolate, ground, prepared, or in any way manufactured, under the provisions of the Act 42 and 43 Vict., c. 21, s. 3, shall be payable on that product of the cocoa-bean which is generally known as cocoa-butter." As the House of Lords no longer interferes with questions of Ways and Means, the adopted motion has now the force of law, and accordingly a duty of 2d per lb., equal to about 15 per cent *ad valorem*, is now levied on cocoa-butter, as it has long been on imported ground, prepared or manufactured cocoa, while the raw cocoa-beans used by British cocoa manufacturers pay, as heretofore, a duty of 1d per lb.

At first sight the contention that cocoa-butter, which is the fatty oil extracted from the cocoa-bean in the preparation of the commercial product known as pure cocoa, and therefore essentially a product falling under the denomination of "cocoa, in any way manufactured," should pay the same duty as foreign prepared cocoa appears entirely reasonable. That was the view of the Chancellor of the Exchequer and of the House of Commons. It would appear, in fact, that cocoa-butter has hitherto been admitted duty free by a pure misapprehension on the part of the Customs officers, who have looked upon it as a vegetable fat or wax. In all probability its duty-free importation might have continued to the Greek Kalends but for the action of the German Government who have recently extended to the cocoa manufacturers of the Fatherland a drawback bounty on exported cocoa-butter equal to that which they have already been in the habit of allowing those gentlemen upon exported cocoa. This step has called forth remonstrances on the part of certain British cocoa manufacturers, who contend that the German bounty-fed cocoa butter competes unfairly on the British market with their own product, and the Chancellor of the Exchequer's motion is the result of the British makers' complaint.

If this were the whole of the matter there would scarcely be room for doubt that the action of the Government was justified and no one, we fancy, would have objected to it. But the question is much more complicated, and the British cocoa manufacturers, it eems, are not quite unanimous in welcoming the duty. The great firm of Fry & Sons of Bristol, for instance, are understood to be hostile to it, and their opposition was voiced in the House of Commons by Mr. J. Hudson Kearley, the Liberal member of Devonport, who, as a partner in the wholesale tea and coffee firm of Kearley & Tonge, may be expected to know something about cocoa. Another Liberal, Mr. Thos. Lough, the member for West

Islington, who happens to be chairman of the Tower Tea Company, also took part in the debate, though on which side is not clear from his remarks. We have been at some pains this week to collect the views of the leading British and foreign cocoa manufacturers on the matter, and find, as we expected that the first-named with the single exception of Messrs. Fry, are strongly in favour of the duty. Not all of our informants care for the publication of their names in connection with the expression of their opinion, but their arguments for and agaiust the duty may be summed up as follows :—

The two principal cocoa-manufacturing countries are England and Holland. Germany, in spite of the bounty-allowance to which we have referred, takes quite a back seat. Now there are, both in England and in Holland, manufacturers whose output of cocoa-butter as a by-product in the manufacture of "pure cocoa" is larger thau their requirements of cocoa-butter as an ingredient in confectionary (which is the purpose to which the article is mainly put, the pharmaceutical use suppositories and the like being comparatively small), and who are therefore compelled to throw their excess on the market. This is mainly done by public auctions, held once a month in London and Amsterdam. About 400 tons of Cadbury's cocoa-butter alone are disposed of in this way in London every year, and a rather larger quantity of Van Houten's cocoa butter is similarly sold at Amsterdam. The Chancellor of the Exchequer gave certain figures showing the percentage proportion of cocoa-powder, cocoa-butter, and manufacturing waste yielded by the roasted beans. His figures are considerably at variance with those supplied us by Messrs. C. Barry & Co. of Finsbury, and by Messrs. C. J. van Houten & Zoon, the leading Dutch cocoa manufacturers, and we hope, for the sake of the British cocoa makers, that the Chancellor was misinformed, and that more cocoa-powder can be made out of a given quantity of beans thau he seems to think. Here are the figures :—

	Cocoa-powder Per cent.	Cocoa-butter Per cent.	Waste Per cent.		Beans
Sir M. Hicks-Beach	44·5	32·5	23	=	100
Messrs. van Houten	55	23	22	=	100
„ C. Barry & Co.	34	50	16	=	100

Now, raw cocoa-beaus are admitteed into Holland duty free, while the British manufacturer has to pay a duty of 1d per lb., or say, about 18 per cent. *ad valorem* on the raw beans, which is equal to a duty of 1¾d per lb. on the roasted article. To that extent, therefore, the Britisher is already initially handicapped in competing with the Hollander in neutral markets, and it therefore, speaks volumes for the excellence of Messrs. Cadbury's manufacturiug arrangements that they should still be able largely to increase their export trade year by year, as they assure us they do. In addition to this initial vantage ground, the Hollander has hitherto been able to send his cocoa-butter into the British market duty free, while the British maker (who is allowed no drawback or bounty) really pays from one-third to one-fourth of the whole duty on that percentage of cocoa-butter contained iu the bean. In other words if, say Messrs. Cadbury Brothers were to establish a branch of their cocoa works in Holland, they would, under the old arrangement, have been able to import that portion of their cocoa butter made across the Channel into Britain duty free, while ou that made in Birmingham they would have paid an equivalent of about 1½d per lb. in duty.

The chief argument of those who oppose the duty is that cocoa-butter is employed in very large quantities in the preparation of coufectionery, and that it is therefore iu the interest of that industry to obtain it as cheaply as possible. The first effect of the new duty will be to diminish, if not to stop, the importation of foreign cocoa-butter in this country; the next, to increase the price of the English product sold by such firms as Cadbury Brothers, Epps & Co., Taylor Brothers, and others. The total quantity of cocoa-butter now produced in England is believed to be barely sufficient to meet the requirements; but the output is probably increased somewhat faster than the demand. The new duty will, it is argued, come out of the pockets of the British users of cocoa-butter, who will thus be handicapped in their competition with those British confectionery manufacturers who themselves produce cocoa butter. It is further argued that foreign "pure cocoa" or "cocoa-powder" already pays 2d per lb. duty, against 1d per lb. paid by the British cocoa maker for his beans, and that this difference more than countervails any advantage the foreigner may have reaped from the free importation of cocoa butter, inasmuch as tho English maker only pays 9s 4d duty per cwt of beans, while the foreigner, at the rate of 61½ lb. of cocoa powder yielded by 1 cwt. of beans, pays 10s 3d per cwt. and that therefore, so long as the foreign manufacturer does not send more than 23 lb. of cocoa butter to every 45 lb. of cocoa powder, the Britisher has nothing to complain of. But the advocates of the duty contend that only about 20 per cent of the cocoa powder made in Holland is imported into England, while the proportion of Dutch cocoa-butter which has been sent hither is much greater. This the foreign makers deny. They say that the proportion of foreign cocoa butter to cocoa powder imported into England is much less than 45 : 100, and they maintain that while benefitiug ouly at most half-a-dozen British cocoa manufacturers, the new duty will not interfere with their trade to any large extent.—*Chemist and Druggist*, July 11.

COFFEE IN BRITISH CENTRAL AFRICA.

"It never rains but it pours" may be the thought of our readers when, after hearing of a great coffee planting undertaking proposed for Costa Rica, they are asked to consider what is being done in British Central Africa. But in reality, the Nyassaland State—under the wise, energetic administration of Sir Herbert Johnston—has a nearer and dearer interest for Ceylon planters and merchants. First of all, it is British territory under a permanently peaceful and stable as well as liberal Government; and seeing how lamentably "coffee" growing has decayed within the British Empire—as we made plain in our recent letter to the London *Times*, which has attracted much attention in "the City" and indeed all over the planting world—it is of peculiar interest to find one new Dependency with a fair prospect of redeeming the balance. For, if only the transport question be solved, by a railway being made from the coast to near the coffee region within a reasonable time as Sir Herbert Johnston remarked, we can see no reason why the history of Nyassaland, or the Shiré Highlands, should not in the next twenty to thirty years, parallel that of the Kandyan country of Ceylon in the "forties," "fifties" and "sixties" of this century. Already a fair beginning has been made: there are several scores of European coffee planters (some of them ex-Ceylon men) at work; the area planted must equal 2,000 acres chiefly young, and the year's export of the fragrant bean is already over 6,000 cwt. There is a vast extent of suitable forest-land untouched, purchaseable at public auction at from 2s 6d to 5s upset price. Of the labour supply being sufficient and at wonderfully cheap rates, Sir Herbert Johnston has no fear, and the climate—though there is always a certain amount of risk in pioneering—is really no such bugbear as many parts of the Ceylon hill-country were fifty and forty years ago when fever and dysentery so often laid low Dumbara and Matale and Yakdessa planters. Here there is a field for "the younger son" trained in a good school as a hard-working, self-reliant planter with the proper amount of patience and tact to work native labour, kindly and considerately but firmly; and with the requisite amount of backing in "capital"—say from £1,000, or better

£2,000 upwards. Already, as we have hinted, Ceylon has a direct interest in Nyassaland separated only by the Indian Ocean—in the fact that the first "Nyassaland Coffee Estates Co." was founded and supported in Colombo, and is worked by Ceylon men as well as capital. Moreover, we have given surveyors, draftsmen, botanists as well as planters to the new Dependency; only given the Railway, we may well expect to see a veritable El Dorado for coffee speedily developed within easy reach of the coast and of the European markets. No "leaf" or other disease has as yet appeared in Nyassaland. The greatest care has been taken about the seed, and Sir Herbert Johnston has a theory that the fungus is not likely to penetrate so far into the interior. Be that as it may, we are clear that Lord Salisbury may well—with the facts before him—give his best support to his able lieutenant, the High Commissioner, who is so bent on making the road easy to his rich, healthful, highland country. For our part, we think it a great pity, from a planting and commercial as well as social point of view, that the railway from the coast into British Central Africa is not to take precedence of that very long, costly and uncertain line through "British East Africa" to Uganda. But as a Company has been formed for the former, let us hope that no time will be lost in starting and constructing this indispensable line, which is certain to prove more and more useful, and profitable, as years roll on.

THE ACME PACKAGE CO., LTD.

Report by the Directors to the second ordinary general meeting of the Acme Package Company, Limited, to be held within the registered office of the Company, No. 82, West Regent Street, Glasgow, on Tuesday, the 28th day of July, 1896, twelve o'clock, noon. The directors beg to submit herewith the balance sheet of the Company's affairs as at 30th June, 1896.

As will be seen from the balance sheet, the profit, together with £107 13s. 11d. brought forward from last year, is £3,533 10s. 9d. Out of this sum the directors propose to pay a dividend of 12½ per cent. on the capital of the Company as called up, including the interim dividend paid in April—carrying forward a balance to meet bonus to Manager and Directors' fees.

The Directors are pleased to state that the prospects of the Company are exceedingly gratifying, and, to cope with the increased output, they have acquired the Glasgow Steel Works at Polmadie on favourable terms.

MARKET FOR TEA SHARES.

Thursday Evening, July 30.

A quiet tone has prevailed during the past week, the tendency being to curtail commitments for the present, in view of the near approach of holiday time. Attention has also been rather diverted to dealings in the new issues, announced in our last week's report. There have been some exceptions, notably in the case of Lungla Ordinary and Chargola Ordinary, which have touched 12½ up and part respectively.

Mincing Lane has again been characterised by a firm tone. There are indications of the season being one more for quality than quantity of produce.

FRESH ISSUES.

Consolidated Tea and Lands Co.—This company has made formal application to the Stock Exchange for an official quotation and a special settlement for all three classes of its shares. Business has been rather more curtailed, but the Second Pref. are still asked for at 2¼ premium and the Ordinary at 1½ premium. The Firsts are "a shade" easier at about 1⅜ premium.

Empire of India and Ceylon.—This is the name of the new Company whose flotation we announced last week as the India and Ceylon Company. The name had to be altered so as to avoid clashing with the existing company called the East India and Ceylon Company. Quotations for the shares are :—

Preference	..	⅝ ⅞ prem.
Ordinary ..	..	1½ 1¾ prem.

Associated Tea Estates of Ceylon and British Ceylon Tea Company.—We do not hear of many dealings in the shares of these two recent issues.

REPORTS.

Bor'uli and Dapoota Companies now issue their reports, which have a special interest owing to the fact of these two properties now forming the *pièce de résistance* of the Empire of India and Ceylon Company's Estates.

CEYLON SHARES.

C. T. P. Co. Prefs. have again been taken at 18. Nothing in the ordinary.

Ceylon and Oriental £3-paid shares are wanted at 3¾, but ask 3⅞ up to £4.

Dimbula Valley Prefs. have changed hands first at 6 1·16, and then successively at 6⅛ and 6¼, while the Ordinary have been done at 5⅛ up to 5½.

Lanka Plant. Ordinary have been taken at £7, and the Prefs. at 10½ or thereabouts.

Standard Tea Co. £6 changed hands early ending week at 15⅛, but are now wanted without finding any more shares.—*H. and C. Mail*, July 31.

MEDICINAL VALUE OF SUGAR.

The grocer who has a good candy trade, but who is told several times a day by anxious parents that children would be healthy if there was no confectionery on this earth, might find it to his advantage to cut out a part of this article and paste it on the side of the "candy case." The language as well as the ideas are borrowed from *The Helper*, which takes the ground that "the general public has a wrong impression as to the actual advantages of sugar in the preservation of the human frame. Harm may be done by eating sugar in excess, just as the excess of anything else is pernicious to health. In the stomach it is in part changed to lactic acid; and the latter acts upon calcic phosphate and permits their assimilation. How frequently a mild case of indigestion could be relieved, if not cured, by an occasional drink of sugar and water.

"Do our readers realize the importance of a few bonbons after a healthy meal? The fatty substances that might otherwise overload the stomach then become harmless. Those who enjoy coffee and tea at night, yet hesitate drinking these beverages, can partake of the same in moderation without fear of sleepless night, by the liberal use of sugar. The recent experiments previously mentioned in these pages, showing that sugar increases the muscular power possible to develop during a given period, are only a scientific determination of what is already known. One need only visit a sugar cane plantation in the West Indies to appreciate that the "nigger" can develop more work in a given time, if allowed to eat the cane freely than during any other period of the year. Sugar has its advantages for stout people, a fact known to both of us, but the advantage to be derived from a moderate introduction of sugar as a means of retaining health is too frequently overlooked."—*Interstate Grocer.*

HORNSEY TEA ESTATES CO., LTD.

The share capital of this Company is £50,000 divided into 4,000 cumulative six per cent preference shares of £5 each and 6,000 ordinary shares of £5 each. Debentures £20,000 in 400 five per cent mortgage debentures of £50 each. First issue £30,000 1,600 cumulative 6 per cent preference shares of £5 each, 2,400 ordinary shares of £5 each, and 200 5 per cent mortgage debentures of £50 each. The Company is acquiring Hornsey and Abercairney estates in Dikoya, and the price for both estates is £30,000. The London agents are Messrs. L. Reiss Bros., and the London solicitors Messrs. Harwood & Stephenson, and Messrs. De Saram act as legal advisers in Ceylon.

THE "THIRTY COMMITTEE."

Minutes of proceedings of a meeting of the "Thirty Committee" held at Colombo on Saturday, the 15th August 1896, at 12 o'clock noon.

Present:—Messrs. A. W. S. Sackville, Chairman; A. Philip, Secretary; F. G. A. Lane, R. A. Galton, Gordon Fraser, E. Rosling, F. M. Mackwood, John H. Starey, H. V. Masefield, R. S. Duff Tytler, J. N. Campbell. C. W. Horsfall, H. J. Vollar and F. F. Street, visitor.

The notice calling the meeting was read.

The minutes of proceedings of a meeting of the Committee held at Kandy on Saturday, the 11th July 1896, were submitted for confirmation. Resolved:—"That they be and they are hereby confirmed."

Submitted letters, &c., from the Manager, National Bank of India, Limited.

Submitted letters from the Treasurer of the Colony.

Read letters from the Manager, National Bank of India, Limited, with statement showing the letters of credit issued by the Bank in favour of Mr. Wm. Mackenzie, and the amounts drawn against these credits which have been debited to the Ceylon Tea (New Markets) Fund.

REPRESENTATIVE IN AMERICA.

Read letter from Government confirmatory of previous communication as to the Governor in Executive Council having been pleased, with the advice of the Executive Council, to sanction the expenditure of a second sum of £3,000 sterling in the United States of America in advertising Ceylon tea.

Read letter from Government acknowledging receipt of copy of minutes of proceedings of a meeting of the "Thirty Committee" held at Kandy on Saturday, the 13th June 1896, which were confirmed at a meeting held on the 11th July 1896.

Read letters from Mr. Mackenzie to Mr. Sackville dated London, 25th and 26th June, and New York, 11th July 1896.

Read letter from Mr. D. B. Wallace dated Chicago, June 6th, 1896. Resolved:—"That the matter be left in Mr. Mackenzie's hands.

Read letter from Mr. S. Elwood May dated New York City, 8th July 1896.

Read letters from Mr. Mackenzie to the Secretary dated London, 26th June 1896, and New York, 13th July 1896, the former asking that six sets of photographs illustrating tea garden, factory, plucking, manufacturing, new clearing, &c., &c., might be sent him.

The CHAIRMAN intimated that he had personally made a selection, and hoped that the photographer would have them ready for forwardment without further delay.

Submitted and laid on the table for the inspection of the Committee the Statements of Accounts as received from Mr. Mackenzie.

Submitted and laid on the table for the inspection of the Committee Abstract of the Ceylon Tea (New Markets) Fund as from 1st January to 30th June 1896.

GREEN TEAS FOR THE UNITED STATES OF AMERICA.

Considered Report of the sub-Committee of the "Thirty Committee" appointed to report on the question of the export of Green Teas to America.

Considered letter from Messrs. Whittall & Co., Agents and Secretaries of the Upper Maskeliya Estates Company, Limited, submitting copy of Resolutions passed on the subject. Resolved:—"That the following report of the Sub-Committee as amended be and the same is hereby adopted."

REPORT.

The Sub-Committee have the honour to submit the following scheme for the approbation of the "Thirty Committee":—That the "Thirty Committee" be recommended to offer encouragement to Producers and Shippers of Green Teas, and Oolongs to be consigned direct from Ceylon to the United States or Canada, by granting the value of presentable samples for distribution at destination of the shipment, quantity not exceeding 5 per cent of invoice of same; provided that the results of such shipments as receive assistance from the "Thirty Committee" be placed at the disposal either of the Ceylon Commissioner or the "Thirty Committee" and provided that the "Thirty Committee" restrict the outlay necessary for such a scheme to a sum not exceeding £1000 sterling in the first year out of the funds derivable from the Tea Cess. The Sub-Committee further recommends that the "Thirty Committee" be represented at the place of export by an Agent, who will be relied upon to draw and to pack the proposed samples affixing such label as may be approved, the cost being chargeable upon the Funds of the "Thirty Committee."

CEYLON TEA AT THE INTERNATIONAL EXHIBITION AT GENEVA.

Read letter from the Secretary, the Ceylon Association in London, stating that Messrs. J. Tetley & Co. in acknowledging receipt of £200 being the vote allowed them for the Geneva Exhibition, write that after a visit to Geneva they will furnish full particulars of what they are doing there to push Ceylon tea for the information of the Committee.

CEYLON TEA IN RUSSIA.

Read letter from Mr. Rogivue dated Moscow June 6/18, 1896, enclosing a list of the newspapers and illustrated periodicals in all of which he has had advertisements of Ceylon tea regularly inserted for the last six months as per his last accounts.

CEYLON TEA IN BELGIUM.

Read letter from Mr. E. R. Templer making an application for a grant of Ceylon tea, and of a sum of money to enable him to push and advertise pure Ceylon tea in Belgium and Holland.

Read letter from Mr. R. D. Ormsby commending Mr. Templer's application to favourable consideration. Resolved:—"That Mr. Templer's offer be accepted, and that a grant of 1,000 lb. of suitable Ceylon tea be made together with a sum of £25s sterling for advertising Ceylon tea in Belgium and Holland."

CEYLON TEA IN AUSTRIA AND HUNGARY.

Read letter from Cooper, Cooper & Co., Ld., London, asking for a grant on behalf of two gentlemen who would use it solely to push pure Ceylon tea in Austria and Hungary. Resolved:—"That the letter be acknowledged, and that Messrs. Cooper, Cooper & Co., Limited, be informed that the matter will have consideration."

CEYLON TEA IN NORWAY.

Considered letter from Mr. C. Palliser. Resolved:—"That 250 lb. of suitable Ceylon tea, at from 50 to 60 cents per lb., duty paid, be granted in such quantities as may be desired by Mr. Palliser for free distribution, and that Mr. Palliser be requested to furnish particulars of the towns and districts in which the samples have been distributed."

The "Thirty Committee" then adjourned.

A. PHILIP,
Secretary to the "Thirty Committee."

ORIENTAL ESTATES COMPANY.

London, July 31.

At the meeting yesterday of the above Company, the report and accounts were received but not adopted. A general committee of five, viz., three representing the preference shareholders and two representing the ordinary shareholders, was appointed to draw up a scheme of reconstruction, in conjunction with the Directors, to be presented to the shareholders as soon as possible, access to all books and documents being provided for, and if found necessary the committee was authorised to appoint competent valuators to value the assets. The three gentlemen appointed to represent the preference shareholders are Mr. Claude Bishop, Managing Director of the Consolidated Trust Limited, Mr. McCaskie, Q.C., and Mr T. J. Lawrance, the two for the ordinary shareholders being Mr. Slaughter and Mr. Touch.

From the *Times* of the 1st inst. we take the following:—The tenth annual general meeting was held on Thursday at Winchester-house. Mr. Quintin Hogg, who presided, remarked that the year's working had been fairly favourable. A profit had been made both in Mauritius and Ceylon, while the cost of production had been lower in both places. At a recent meeting of preference shareholders a committee was appointed to consider the question of reducing the capital and to confer with the directors, and, if necessary, with the ordinary shareholders. The directors had had one meeting of the committee, who had met them in a very friendly spirit, and had proposed an alternative scheme. It had, however, been thought that it was only fair that the ordinary shareholders should have a voice in the matter, and it was therefore proposed that two ordinary shareholders should be appointed with three preference shareholders, so that both sides should be represented. The committee would then go fully into matters and report to another meeting which would be held as soon as possible. He did not intend to ask them at that meeting to adopt the report, as they would no doubt prefer to receive the committee's report first. He would therefore propose that the directors' report be received, but that its further consideration should be postponed until the shareholders had had the committee's report. The directors wanted to see the company's interests in Mauritius considerably reduced, and steps had been taken in that direction. They contemplated putting some land under coffee cultivation in the Malay Peninsula, but they would not do so if it were not the general wish of the proprietors. They thought, however, that it would be wise to add a further string to the company's bow. Sugar was a very speculative article, and tea depended very much on exchange, whereas coffee was much more profitable. Mr. A. W. Crichton seconded the motion. A discussion followed, at the close of which a committee was appointed, formed as had been proposed.

THE SOUTH TRAVANCORE TEA COMPANY, LIMITED.

Share Capital £50,000, in 5,000 Shares of £10 each.

DIRECTORS.—T. C. Owen, Esq. (Messrs. Rowe, White & Co.), 16, Philpot Lane. A. V. Holland, Esq., 13, Highlands Gardens, St. Leonard's-on-Sea. Neill Graeme Campbell, Esq. (Messrs. Campbell Brothers & Co.), 36, Eastcheap, E.C. *H. M. Knight, Esq., Venture Estate, Travancore, Southern India. * Will join the Board after allotment.

AGENTS.—Messrs. Rowe, White & Co., 16, Philpot Lane.

PROSPECTUS.

This Company has been formed for the purpose of taking over, as a going concern, the "Venture" group of estates in South Travancore, Southern India, comprising "Venture," "Arnichardi," and "Neddumpara," consisting of a total acreage of about 801 acres, of which about 500 acres are in Tea, averaging 5 years of age; about 125 acres in Liberian and Arabian coffee; about 6 acres in Nutmegs; about 100 acres in Virgin Forest; and a few acres in grass.

The estates are in a very efficient state of cultivation and lie at an average elevation of about 1,100 feet. The factory, which is well built and fitted with machinery worked by steam power, is within three miles of a Government road, to which it is connected by a good cart road. Fuel is abundant on the property. Tea can be manufactured and put f.o.b. at Tuticorin for 26 cents per lb., the equivalent for which, at 1s 2d, is 3½d. The total cost in London, after payment of all charges, is about 4¾d per lb.

Judging by past results, the tea may be expected to realize an average of 7¾d gross, after making allowance for lower markets than are current at present. The tea crop for the current year, the Vendor, Mr. H. M. Knight, estimates at 200,000 lb., and therefore, the net profit from tea alone should be about £2,500 per annum.

The coffee is mostly young and should give regular and substantial returns, which should increase as the trees mature. For this year, the Vendor estimates the profit will be £700. The tea is now in full bearing. The profits for 1881 and 1695, the last two completed financial years, average over £2,500 per annum. The Vendor estimates that the profits for the current year will largely exceed those of 1891 and 1895. The rainfall on the estates is about 100 inches, and is fairly distributed.

Arnichardi and Neddumpara are freehold, direct from the Government. Venture is held under a lease at a nominal quit-rent from the Government, and is renewable at the option of the Company.

No Debentures will be issued against the property except with the assent of a majority of two-thirds of the Preference Shareholders. The estates will be taken over as from July 1st.

The amount required to meet the yearly interest on the Preference Shares is £825. After making an ample allowance for London expenses, and basing the calculations on the average results of the last two years, there should remain sufficient to pay more than ten per cent. on the Ordinary Shares. In this calculation no account is taken of the fact that the coffee, being mostly young, should give much better results in the future than it has in the past. Mr. Knight has expressed his willingness to undertake the general management of the Company's estates in Travancore. The purchase price of the estates has been fixed at £26,000, payable as to £10,000 in 1,000 Ordinary Shares of £10 each, and £3,250 in 325 Preference Shares of £10 each, and the balance, viz., £12,750 in cash. The present issue of capital amounts to £27,500, which will allow a sufficient margin for working expenses.

THE ACME PACKAGE CO.

The *Glasgow Herald* of the 29th ult. says:—The Acme Package Company (Limited) have declared a dividend of 7½ per cent, which, with the interim dividend of 5 per cent, makes 12½ per cent for the year. A planter in forwarding the extract says:—I enclose a para to hand by today's mail which shows that the Acme tea chests must be more generally used than Ceylon planters are aware of. A company declaring a dividend 12½ per cent must be doing a good business, and in these days of scarcity of Moni chests, the Acme package might be worth more attention from Ceylon growers. Cannot you find out the opinion of the London buyers on these packages?

THE DICTIONARY OF ECONOMIC PRODUCTS OF INDIA.

This magnificent work, by Dr. George Watt, C.I.E., &c., and numerous contributors, was intended, when the first volume was issued in 1889, to consist of six volumes: but Vol. VI had to be expanded to four parts, the last of which was published in 1893; and now we have received from the Government of India an additional volume, containing an index to the work. This has been prepared by Mr. Edgar Thurston, Superintendent of the Government Museum, Madras; assisted by Mr. T. N. Mukerji, F.L.S., Assistant Curator, Indian Museum, Calcutta. The index is a polyglot one. First we have an English list, including classical or foreign names in familiar use. Next comes a list of Sanskrit, Arabic, and Persian names. Then comes a lengthy list of names in all the "Aryan" (or "Gaudian") dialects of India, including the transfrontier districts. Next we have lists in the languages or dialects of the hill-tribes, the Dravidians, the Mongolians, Burmese, Andamanese, and lastly "Cinghalese." (Why *will* Mr. Thurston adhere to this atrocity?) The spelling of the Sinhalese names is in many cases pretty correct; but in very many by no means so. For instance, we have such fearful and wonderful forms as *calukeale*, *corallia*, *dungazha* (!), *hæmarago*, *kawhy-ya*, *kokabá-larz* (!), *kokubulurz* (!), *maha-erraminza*, *maha-naram* (!), *penquin* (!), and, to end up with, *ziniagaha*! Of course the compilers of the index have simply copied the forms given in the body of the work; but surely Dr. Watt might with very little trouble have obtained the correct spellings of the Sinhalese words. This "Cinghalese" list is a blot on an otherwise excellent work. The *Dictionary of Economic Products* is a perfect treasurehouse of useful information; and under the title of *The Agricultural Ledger* the Government of India continues from time to time to issue pamphlets furnishing information supplemental to that given in the *Dictionary*.

THE DOOMOO TEA COMPANY OF CEYLON LIMITED.

The first ordinary general meeting of the shareholders of this Company was held in the office of the Agents and Secretaries (Messrs. J. M. Robertson & Co.) today at noon. Mr. F. W. Bois presided, and present were Messrs. W. D. Gibbon, W. B. Kingsbury, E. John, C. Minto Gwatkin, Moir, Gordon Frazer, and J. B. Mason (Superintendent) and Gordon Bois (Secretary.)

THE REPORT.

The report of the Directors, submitted by the Chairman, was taken as read. It is in the following terms:—

The Directors have now the pleasure to submit their Report and Accounts for the year ending 30th June, 1896.

The quantity of Tea received from the two Estates was 150,692 lb. against 150,000 estimated, and the price realized for that sold locally was 50 $\frac{35}{100}$ cts per lb. The Tea shipped to London amounting to 35,660 lb. has been estimated to realize a sum which the Directors consider safe.

During the year about 120 acres of Coffee on Verellapatna have been planted up with Tea, and the acreages of the Estates now stand as follows:

Doomoo ..	160	acres	tea 5 years old and upwards.
	30	,,	4 ,, ,,
	20	,,	3 ,, ,,
	3	,,	planted amongst coffee
	23	,,	Timber
	63	,,	Grassland
	299		

Verellapatna	180	acres	Tea 5 years old and upwar
	130	,,	4 } 3 } ,, ,,
	35	,,	2 ,, ,,
	120	,,	Tea and Coffee
	10	,,	Grass
	213	,,	Waste and Chena
	688		

The result of the year's working, after writing off R5,941·23 for interest due to the vendors of the properties, show a profit of R26,751·49, and the Directors recommend that a dividend of 6 % on the capital of the Company-R100,000-be paid absorbing

sorbing	R24,000	00
That a sum be transferred to depreciation account of ..	R2,500	00
and that a balance be carried forward of	R251	49
	R26,751	49

It should be noticed that the profit shown is really the result for 9 months only, as the share capital was not finally called up until the end of Sept. 1895.

In accordance with the articles of association all the Directors retire, but being eligible offer themselves for re-election.

It will also be necessary to appoint an auditor for season 1896-97.—By order of the Board of Directors,

J. M. ROBERTSON & Co., Agents and Secretaries.

Colombo, 15th August, 1895.

The CHAIRMAN said he regretted that the accounts were not quite so good as they expected them to be, arising from the fact that the coffee crop had fallen short of the estimate—it was not much more than half—and this made a difference of 1½ per cent on the dividend. Then again interest on the purchase money made another 1½ per cent on the dividend, so that the two together would have made a nine per cent dividend for the year independent of the fact that the shareholders did not pay the value of their shares until the end of September, and, therefore, so far as they were concerned, the working was for nine months only, the dividend of 6 per cent being for that period. Shareholders would notice that there was a very large quantity of young tea. The tea which was higher up did not mature so quickly as that at a lower elevation, and the yield from the four-year-old tea was not much more than sufficient to pay expenses, but as it got older it would show a larger profit. In addition to that there was a large quantity of young tea which gave no yield at all. He did not know that he had anything further to say, but he himself considered that the future of the Company was satisfactory. The estimate for the present year which would be shortly before the directors (it had only just been received) showed a rather larger tea crop and a rather larger coffee crop than they had realized during the present year; but he thought the latter must be considered as very doubtful as coffee was evidently on its last legs in Madulsima. They must not depend on that in future, and the Company must be entirely a tea company. He should be glad to answer any questions that might be asked by shareholders.

MR. GORDON FRAZER:—What was the rate of interest paid to the vendors of the estates?

The CHAIRMAN:—Eight per cent.

MR. GORDON FRAZER asked, with reference to an item in the accounts, at what rate the company had taken over the stock of tea.

The CHAIRMAN replied, at a value of 48 cents. The average for the year was something like 50 cents. They had heard of a sale in the home market before the recent rise which fully bore out their valuation.

Mr. Gordon Bois said the sale they had heard of was 4 cents per lb. over the rate they had taken.

Mr. Gwatkin asked for an explanation of the item "Rents collected in Colombo R300."

The Chairman said they collected in Colombo the rent of the post office on the estate. He then proposed the adoption of the report, a motion which was unanimously agreed to.

Mr. John proposed and Mr. Moir seconded:— "That a dividend of 6 per cent on the capital of the Company be paid."

The Chairman said they now had to appoint directors. According to the articles of association the three directors, Messrs. F. W. Bois, W. D. Gibbon, and W. B. Kingsbury, retired, but they were eligible and offered themselves for re-election.

Mr. Moir said he had much pleasure in proposing that the retiring directors be re-elected for the present year.

Mr. Gwatkin seconded, and the motion was unanimously adopted.

The Chairman said they had to appoint an auditor to audit the accounts for the year 1896-97. The directors had appointed Mr. John Guthrie.

Mr. Gwatkin proposed and Mr. Mason seconded the election of Mr. John Guthrie, as auditor for the year 1896 97 at a fee of R50. Agreed.

Mr. Moir:—Could you tell me what the estimates are?

The Chairman replied that the directors were rather against giving estimates because they were disappointing unless realized. As a matter of fact, the estimates only came down yesterday, and they had not gone into them.

Mr. Gordon Frazer asked how much of the 130 acres bracketed together in the report was three years old and how much four years old tea.

The Chairman replied that they were sorry they were obliged to bracket them together. It was quite impossible to tell the difference in age. Mr. Mason, whom he had consulted, told him it was very difficult to tell the proportions, and for that reason they were bound to bracket them. Mr. Mason would confirm what he had said.

Mr. Mason remarked that the land was opened in little pieces, and that if he could have told the proportion of three year to four year old tea he would have put it in.

The Chairman:—Mr. Mason says the four year old tea is giving from 200 to 220 lb. an acre. Although the yield at that rate did not pay expenses it was the yield above that that would pay the profit. I may mention as of interest that all the young tea coming on is superior to the old—it is a better jât.

Mr. Mason:—It is a better jât and in very much better soil.

Mr. Gwatkin asked what was about the elevation.

Mr. Mason replied that the elevation of Verellapatna was from 4,200 to 4,500 feet and of Doomoo from 3,500 to 4,200 the average was about 4,300 feet.

On the motion of Mr. Gordon Frazer, a vote of thanks was accorded to the chairman, and this closed the proceedings.

PINE HILL ESTATE COMPANY.

(*By Telegraph.*)

Kandy, Aug. 22.

A meeting of this Company was held in the office of Messrs. Borrett & Fisher this afternoon at 12-30. Present:—Messrs. Mackwood, Bowle Evans, Prance, Trimen, Wright, Borrett, and by proxy Mr. Waddilove. The first resolution *re* selling Nahakettia estate was passed, the purchaser being Mr. Lipton for the amount set down in the resolution. Regarding the second resolution it was decided that R40 per share be used for reducing the capital, utilizing part of the money received by selling Nahakettia, the balance to be placed in the suspense account till the directors decide what should be done with the same. No other business was transacted. The directors' meeting immediately followed the Company meeting, when the accounts were examined.

The resolution referred to is as follows:—To authorize the Directors to sell Nahakettia estate, situated in the district of Haputale, belonging to the Company, at or for the price or sum of one hundred and ninety thousand rupees (R190,000) as from the 1st day of July 1896, as per powers conferred under clause No. 100 of the Articles of Association; and to decide on the best mode of dealing with the money received by sale of the Nahakettia estate.

THE PACKING OF TEA.

A friend writes asking us if the present system under which tea is packed for shipment can be considered altogether satisfactory. In his opinion it seems to be capable of improvement, and he suggests certain directions in which he thinks it possible that this might be effected. We are not prepared to ourselves offer any opinion upon the suggestion he has made. But we feel, that, however crude, however impracticable they may be, any contributions upon the subject might set more practical minds thinking with advantage, and we, therefore, while declining any responsibility for them, proceed to recite briefly what has been written to us on the topic. The argument used as the basis for the discussion is that, practically, under the present system, tea is packed in two cases, one metallic, one wooden. The objection, it is pointed out, to metallic casings of all kinds is their liability to injury by rough handling. The casing of tea lead is open to this liability, hence it has to be protected by wood. The present operation is therefore a dual one, and necessarily therefrom costly. In theory the perfect system would be a single metallic case. But if this is cubical there must be straight edges, and it is these that are the most open to injury. The solution to this difficulty would be to make such metallic cases circular in form. But to this our friend acknowledges a fatal objection. It would add, he thinks, fully 25 per cent to the space required for ship stowage, and this would mean an addition in a corresponding ratio to freight charges. But if the present dual casing is to be abandoned, it involves for the protection of so perishable an article as tea a single metallic case of some sort or other. We are asked whether it would not be possible to use two forms of such cases, the one having concave facings, the other convex facings. In stowing the form of the one would fit into the form of the other and so effect solid stowage. It is suggested that plates of some suitable metal, ready stamped with the concavities and convexities and with tail and top ends included in the form of the sheets, could be readily and economically shipped to us. All that would have to be done here would be to solder the single edge and the cut portions of the ends. The meaning of our correspondent seems to be that the sheets should be corrugated in such a form as when beat into cubical, or nearly cubical shape, there should not be any defined

angle that would be liable to injury. We offer the suggestion without expressing any opinion as to whether the idea could be practically worked out.

THE ROYAL BOTANIC GARDENS, CALCUTTA.

BY WM. MAIR.

Calcutta's Botanic Garden would gladden the heart of Examiner-Professor Patrick Geddes, foremost in the Renaissance of Botany, the growing school of bionomics or plant-life study, "Pflanzenleben," as they call it in the botanical atmosphere of Strasburg. The "mercurial professor"—to quote an apt epithet which the versatile Zangwill lately applied to the founder of the newer Renaissance of Celtic culture, would find that for once the canons of taste in gardening he admires so ill, that find expression in crewel-work patterns and in schemes of colour that might as effectually be wrought out by the judicious use of pots of paint in primary colours, had been quite departed from. There are picturesque groups of closely-allied families of plants, clumps of bamboos and other genera of tropical monocotyledons, mostly evergreens of vivid hue; green lawns interspersed with sheets of ornamental water, gorgeous with *Victoria regia* or the white-flowered Padma water-lily (*Nelumbium speciosum*) beloved of the gods; splendid avenues of palms, "their tilted heads like draggled plumes against the sky"; and stately Indian trees and elegant shrubs affording necessary shade in a land where it is summer every day, for more delicate members of the great floral community. There also pretty borders of annuals which blossom gaily in our cold weather months, happy remainder of home gardens. But there is no attempt at arrangement in the natural orders of the books: it would be impracticable with such a profusion of variety; the giant teak and the slender verbena, for instance, would hardly make graceful consorts. The attempt was once actually made by a young superintendent of the garden, whose botanical zeal exceeded his good judgment, to convert the garden into a botanical class-book. Sir Joseph Hooker, K.C.S.I., records (Himalayan journals) that when he visited the place in 1848 "nothing was to be seen of its former beauty and grandeur but a few noble trees or graceful palms rearing their heads over a low ragged jungle or spreading their broad leaves or naked limbs over the forlorn hope of a botanical garden, that consisted of open clay beds, disposed into concentric circles, and baking into brick under the fervid heat of a Bengal sun." The general scheme of the garden has always been economic as much as purely botanical and ornamental, but in its present highly efficient condition, to which it has been brought by its present superintendent, Dr. George King, C.I.E., F.R.S., although only a suggestion of what it will become it is one of the brightest spots in the East.

The garden is quite modern. It was founded over a hundred years ago by the Honourable John Company, but the cyclones of 1864 and 1867 made a clean sweep of everything in it except the great banyan tree to be described hereafter, some sacred peepuls, and a few mahogany trees. It is 272 acres in extent, just about as large as Kew now is, and has exactly a mile of frontage to the river Hooghly. It is four miles out of town, and is a favourite rendezvous with people of the "City of Palaces"—which are mostly stucco ones, by the way—on the numerous holidays bestowed by the Hindu and Christian calendars upon Anglo-Indians, pharmacists, of course, excepted.

It is classic ground to the botanist. Roxburgh, father of Indian botany (the Indian Linnæus), was superintendent here, and Wallich, Falconer, Jack, Griffith, and Royle are among the many great names that are perpetuated in its memorial monuments or its avenues; while one or two of the latter are name in honour living botanists, the Hooker Avenue after the distinguished author of the "Flora of British India," grand old veteran still at 80; and the Dyer Avenue, in some measure of acknowledgment of the good friendship of Kew and its learned director.

Although the range of cultivation is naturally very extensive, and the utility of the garden botanically, horticulturally, and agriculturally correspondingly great, amongst its greatest triumphs may be considered the introduction of tea to Assam and the Lower Himalaya from China, and acclimatisation of cinchona in British Sikkim, it is remarkable that the climate of Lower Bengal is quite unsuited to the growth of very many, even tropical, species. One of the greatest benefits bestowed on India by the garden in its early years was the demonstration by practical experiment that many desirable economic products and exotic plants of economic interest cannot be grown in that portion of the Gangetic delta represented by its soil. Thus, one of the things the honourable merchantmen had in view at its foundation was that the spices, the pepper-vines, the nutmegs, and the cloves, which had once made the trade of the company with the Moluccas so valuable, might be cultivated in Bengal as an additional source of wealth to that resourceful province, but this was soon proved to be impossible. Similarly, the teak tree (*Tectona grandis*) proved a disappointment. In later years an anticipated scarcity of ipecacuanha, so indispensable in dysentery in India, led to the attempt to establish that humble creeper in the garden and in India. The "Pharmacographia" records that up to 1879 success was still "problematical," and it cannot be said even now to have passed out of the experimental stage in which it has been for thirty years. Coca and one or two species of *strophanthus* are at present under trial; one of the latter, *S. dichotomus*, a climbing-plant, has curious, long, ringlet-like tassels hanging down from the edges of the corollas.

The materia-medicist finds much that is intensely interesting and much that is complementary to the text-books in a visit to such a garden as this. Here are *Cassia fistula*, the Indian laburnum, uncommonly beautiful in its long pendulous racemes of large bright-yellow flowers or with its familiar legumes a yard long; the gurjun tree (*Dipterocarpus alatus*), straight as a ship's mast and branchless for 60 feet, and a small specimen at that; the sacred bael (*Ægle Marmelos*); the nux-vomica tree, with its lozenge-like seeds embedded in the pulp of its beautiful orange-coloured fruit which contains strychnine, but is nevertheless eaten with avidity by the hornbills and the monkeys; the handsome evergreen, *Tamarindus indica; Butea frondosa*, the Bengal kino and the real kino tree of Malabar (*Pterocarpus Marsupium*), which might easily be cultivated extensively in Bengal and thereby make the drug less luxuriously expensive; and quite a museum of others. An interesting group of myrtaceous trees on one of a number of artificial mounds, for the ground naturally is as flat as a pancake, includes, besides such species of eucalyptus as will grow in the, to them, uncongenial climate of Bengal, a number of healthy specimens—all are well and prominently labelled,

of the cajuput tree, remarkable for the peculiar structure of its bark. It is not unlike that of birch externally, sometimes an inch thick, but formed of layer upon layer of easily-separable papery-looking tissue.

The pride and glory of the garden is the world-famous banyan tree (*Ficus bengalensis*). It resembles a small forest rather than a single tree, and throws an area of 1,000 feet in circumference into dark, cool shade, a "cloistered labyrinth," richly garlanded with creepers and orchids, planted, as was the banyan itself by the birds. Milton's picture of the "fig tree, not that kind for fruit renown'd," is realistic:—

Branching so broad and long that in the ground
The bended twigs take root, and daughters grow
About the mother tree, a pillar'd shade.

The three splendid conservatories have not an inch of glass in them, but are constructed of a framework of iron covered with wire netting, on which is stretched a thin layer of thatching-grass, while leafy creepers are trained round the sides—a system which has proved completely successful in the cultivation of many tropical species that would otherwise perish in a climate that can vary from between 40deg. to 110deg. F. in the shade, ensuring, as it does, a fairly equable temperature, access of rain and a gentle broken shade from the relentless sun. In the largest, known as the "Orchid House," 200 feet long, the royal family of plants makes quite an imposing show each year, in the month of March when all Calcutta and his wife go to see them. In this house may be seen fine growing specimens of vanilla, which has to be fertilised artificially, and of sarsaparilla, a pretty creeper. The Palm House is built on the same principle and is devoted to such species of equatorial palms as do not take kindly to life out of doors, and here again is a wise departure from the usual order of things for every plant is established in the ground—an obvious improvement over the plan of growing them in tubs. The Herbarium building, which embraces the Library and the Laboratory, is built on the same principle as that of Kew, with the additional feature that it is fireproof. Its *hortus siccus* is one of the most complete in existence, and includes, besides the flora of the Indian Empire and that of Asia outside India, a fair collection representative of Europe and of Australia, and in a less degree of Africa and America. No other herbarium in the world, Kew not excepted, has an equal record for distribution, so lavish in the early years that this herbarium does not possess a single specimen of the priceless collections of Roxburgh, although there are a few at Edinburgh and elsewhere. Distributions are now made each year to thirty-eight of the principal botanical establishments and notable herbaria of the world.

And now a word about the eminent custodian of this great treasure-house of botany. Brigade-Surgeon Lieut.-Col. George King, C.I.E., F.R.S., the greatest botanist in all Asia, has, during the twenty-five years of his incumbency of the superintendentship of the garden, immensely increased the plant-wealth under his care, and maintained and enhanced the reputation of the establishment as an important centre of botanical industry. During those years has been growing slowly and silently under his care, and authorship for the most part, the "Annals of the Royal Botanic Gardens, Calcutta," stately tomes, in quarto, monographs, chiefly of specially difficult Indian natural orders, every line of which represents hours, days, of patient research, authoritative contributions to botanical literature. The plates illustrating each individual specimen enumerated in these volumes are drawn from life, lithographed, and coloured by hand by Bengali art-students with a devotion and a precision which is marvellous to those unacquainted with the faculty of imitativeness innate to the educated native of Bengal. The latest of these volumes—the seventh—has just been published by the Government of India. It treats of the *Bambuseæ*—the bamboos of British India. But what has won for Dr. King the title of one of India's benefactors has been the phenomenal success of the cinchona-plantations in British Sikkim, for which he has been in great measures responsible. Their administration is still part of his duties. The Government of India has not only adopted his recommendations, but has carried them out with a liberality that has been completely justified by results. Figures are tedious, but it is sufficient to say that the considerable initial outlay incurred in the undertaking has been repaid several times over, while something like 40,000*l*. a year has been saved to India by the substitution of countrymade quinine and "Government cinchona febrifuge," an unpurified "quinetum," for the imported articles, while the distribution of quinine in unheard-of numbers of 5-gr. doses, which may be purchased by the very poorest for about half a farthing, is as great a boon as has ever been conferred on India's malaria-soaked millions.—*Chemist and Druggist*, July 25.

RHEA PROFITS.—In discussing the financial aspect of rhea cultivation *Capital* argues that with anything but first-class soil the outturn would not exceed ten maunds which would not pay at all. The price which was realised for Assam rhea (dried ribbons) in small quantities was £16 per ton which paid a fair dividend. Reducing this to rupees, the price works out a fraction over R9 per maund. But we see it stated, says the *Pioneer*, that a Mr. Frederick Pincott has contracted to supply 15,000 tons of rhea ribbon at £7 per ton, or as it is put there, in rupees, R130 F.O.B., and we scarcely see how this can pay, as freight, insurance, &c., to export ports will make a big hole in it alone; R130 per ton works out R4-10 per maund, and, by the calculation made above, our readers will notice that R9 only gave a fair dividend; so the rate of R4-10 per maund from Assam would never cover. The steamer freight comes to R2 per maund, including boating to the shipping mookh, leaving R2-10 for cultivation, cutting, and carrying, and pressing. Doubtless, with a good press, the freight might be considerably lowered, if the Inland Rivers Company could be got to go by measurement, but then these surmises are not safe to calculate upon, and all our figures are based on actuals. Supposing one could get, say R180 per acre for the produce, the result would not be by any means to be despised, but if this figure is reduced by about half, it does not read much. To cut, strip, and carry a maund costs about R1-8 to R2 of the dried ribbons, and when to this is added inland freight we fail to see where the profit comes in. 'Tis true that by the Gomess system there is a saving of 30 per cent in weight, so that we have to add this on to profits, or deduct it from the above working expenses, but, even with all that, we fail to see where the profits can be made, and when we say profit, we mean a decent profit, such as all agricultural followings should give, *i.e.*, an average of 10 per cent over a series of years.

VARIOUS PLANTING NOTES.

THE INDIAN FOREST DEPARTMENT.—The Forest Administration Report for the whole of India, is, we see from Indian contemporaries, on the whole distinctly favourable, the net revenue being considerably in advance of the revenue received in 1892-93 and 1893-94. On the whole, there is a slight increase in the net profits although much new country has been opened since the publication of the last Annual Report at no inconsiderable cost to departmental funds.

TEA GROWN IN NORTH DAKOTA.—The Philadelphia *Grocery World* of May 25 says: –

When asked what products are grown from North Dakota soil, one thinks readily of wheat, rye, oats and flax, but who in the world would name tea as one of the cultivatable crops? Yet tea is grown, and grown successfully, in North Dakota. State Commissioner of Agriculture Laughlin has made the discovery that a colony consisting of twenty Russian families in Mercer County raised tea last year from seed obtained from Russia. The experiment is reported to have been a decided success, and tea culture will be tried on a much larger scale in that State this year. It is known as the Asiatic-Russian tea-plant, and the quality is said to be every way superior to the black tea sold by merchants.

THE ORANGE BEETLE TEA PEST.—Mr. S. É. Peal writes from Sibsagar to the *Englishman*:—I understand that a correspondent of the *Planter* refers to the above. I think he will find it figured and described by me in the "Tea Encyclopædia," many years ago—under the rather elaborate name of the "Dinpromorpha Melanops." It is naturally a grass feeder, and is becoming a tea shoot eater, and in some cases can cause serious damage, by eating the stem of the soft shoots, thus causing them to fall over and die. But it can be eradicated by a little perseverance, by means of a few smart little boys with butterfly nets, made of strong "Marking Kapra" a foot in diameter 20 inches deep, and handles 4 feet long. The net should have a pointed, V-shaped bottom, and each boy has a wide-mouthed bottle, half full of water. As a rule each boy can catch and drown 1500 to 2000 beetles per day, and being slow fliers, they are easily captured. It does not propagate rapidly, like "green fly" or the 'mosquito" (tea bug), and is not found in forest, but where there is some grass, such as "ulu" and the small "kagra."

COFFEE PLANTING.—Thus the *Pioneer*:—Almost every year the Chancellor of the Exchequer remarks that the consumption of coffee in the United Kingdom has been either stationary or shows a decline, being supplanted in popular favour by tea and cocoa which, as popularly prepared, are more palatable and refreshing beverages. But it does not by any means follow from this that coffee-planting is an unprofitable occupation; on the contrary the enormous reduction in Ceylon, Southern India, and the West Indies of the area under coffee and of the exports of the berry owing to the devastation of the leaf disease that attacked the trees, have resulted in sending up the price and keeping it at a high level. Brazil has seized the opportunity to largely extend her plantations and is now the chief source of supply, the exports from Ceylon, once the great centre of production, having fallen from over a million to about fifty thousand hundredweight in the last eighteen years, and the smaller quantities from South India and the West Indies having diminished by about fifty per cent. In the two first named districts tea has usurped the place once occupied by coffee, but a new coffee-growing enterprise has sprung up in Coorg, and plantations are also being opened out in Java. But the supply as yet is barely equal to the demand, and so long as that is the case prices will remain high and coffee-planting be anything but a ruinous occupation.

BANANAS IN ENGLAND.—Says the *Fruit-Grower* of July 1:—From time to time we read of the condemnation of large bunches of bananas which have been seized by the sanitary inspectors of the Local Authorities as being unfit for food. It would be interesting to have a case stated settling the point as to when a banana is in this condition. This is a peculiar fruit, and if exposed to the wind or wet will immediately become discoloured on the outside, while the interior fruit is perfectly good and eatable. Fruitcrers make the mistake of hanging their bunches of bananas in prominent, exposed positions entirely unprotected. We advise them to use a semi-circular shield, which could be made of strawboard or of thin tinned iron, and which would be promptly supplied by fruiterers' and greengrocers' sundriesmen. The shield, if made of tin, should have a turned edge round, and should hang well above and below the bunch of fruit.

A MAMMOTH PLANTING CONCERN.—Our Coonoor contemporay says:—Messrs. Finlay Muir & Co., of the North and South Sylhet Companies, had not been long in Southern India, when it was recognized that their unlimited capital and enterprise would soon be a powerful factor in the shaping of the future of our planting industry. But neither we nor any of our contemporaries, in India or in Ceylon, were prepared for the very big thing they have just floated successfully in London. The Consolidated Tea and Lands Company, Limited, is indeed a mammoth concern, but the apparent ease with which it has been floated is another case in point of the large amount of idle capital at home, idle only for want of sufficient outlet. The capital of the Company is two millions sterling and the properties proposed to be acquired consisted of 180,000 acres of land in Northern and South India and Ceylon; the cultivated area being 31,120 acres, two-thirds being in bearing under tea, coffee, cocoa and coconuts. Of the huge reserve, 90,000 acres are on the Kanan Devans, two-thirds of which are computed to be at between 4,000 to 6,500 feet, a grand elevation for the best qualities of tea and coffee. We are glad to note that coffee is to be taken in hand vigorously, if only for the fact that it will leave less to be planted up with tea. The Assam and Ceylon reserves, 19,000 acres, are to be planted up rapidly; we suppose at least two-thirds will be in tea. Of the two millions of capital, £1,600,000 are to go in the purchase of the lands to be acquired, at the rate of £48 per acre for the cultivated and £1 per acre for the reserve. We are not accustomed to large Companies in South India, and we fancy more regret than appreciation will be felt on the part of proprietors. The swallowing up of the little by the big is inevitable perhaps, but distinctly to be regretted for many reasons. On the other hand, such a large influx of capital and enterprise must do a lot to infuse prosperity in a hundred different ways into the members of our body politic. It is useless to mourn over the change that will surely take place; let it rather be our object to strive to benefit thereby as much as we can. For good or for ill, all the world over, big Companies have come to stay, and small holdings, the dream of statesmen and philanthropists of all nations, will ere long fade utterly away, despite all pious aspirations and legislation to the contrary.—*Planting Opinion*, July 18.

BALATA CONCESSIONS IN GUIANA.—The United States consul at Cayenne, Mr. Leon Wacogne, writes in a recent report: "An interesting point for the future development of French Guiana was debated some years ago without any practical result, viz.: the working of balata gum, similar to, and even better than, the ordinary India-rubber. A scheme of regulations for grants of concessions was elaborated in 1892 by the director of the interior; but they were soon found to be defective, and a new plan, stimulated by the discussions of the council-general, is now being perfected and it is thought it will answer all the requirements of future grantees in helping forward their searches. On December 5, 1895, thirty concessions for the balata industry had been granted to people in the colony and two or three granted in Franco and Europe. A concession has just been given to the representative of an important company of New York (Franco-American Rubber Co.) under special conditions agreed upon between Mr. Joseph M. Jean and the director of the interior. Up to the present, the above company is in the 'prospecting' stage; however, it seems to be satisfied with the first results, and was able in a very short time to ship to New York about 308 kilograms of India-rubber (*gomme de balata*)."—*India Rubber World*, June 10.

CACAO PRODUCTION AND PRICES.—*Planting Opinion* of July 18 says:—The present prices for this product do not make its cultivation very alluring to planters, but though the profits just now are small, a cocoa plantation is a thoroughly good investment. It has few or no insect enemics, and planted in suitable soil and climate has a bearing life almost equal to that of tea. People in "the know" declare that the low prices are artificial, that is to say the manufactured article, cocoa, chocolate, etc., is priced so high that demand is much restricted. Be that as it may, it is a noteworthy fact that the demand is almost stationary, while cultivation is yearly extending. Were it not for the present small crops in South America, where a yearly increased acreage is being brought into bearing, prices would be even lower than they are. If cocoa ever establishes itself in South India, we hope that a chocolate and cocoa factory will be simultaneously started. Certain it is that, unless organized efforts are made by the growers to stimulate consumption, no rise in the market will take place.

TEA CULTIVATION IN JAPAN.—Mr. James H. Veitch, of the famous Chelsea firm of nurserymen, has just printed for private circulation his notes of his travels round the world in 1892; and in writing of Japan he says:—

About ten miles due south from Kyoto is the village of Uji, surrounded by tea plantations, long famous as producing the finest tea in Japan. The tea plant is cultivated in a way different from what I have seen elsewhere. In nearly all the fields the plants in the rows, ranging from $2\frac{1}{2}$ to $4\frac{1}{2}$ feet high, were so old and so inter-grown that each row was a thick hedge several feet through, and only once did I notice solitary specimens. Picking commences the second week in May, after which the tea is cleaned over by girls in the peasants' houses, and then subsequently rolled between the hands of coolies. There are, of course, no great drying or cleaning establishments, each peasant's house, working independently in a small way. Many fields were entirely covered with straw mats on a low scaffolding of poles, and if looked at from above, such as from a high part of the road, one looked down on several acres of mats. I assume that this is done on account of the plants having reached a picking stage, and, it being impossible owing to the cost of labour to pick all the fields at once, the owners endeavour to retard the further growth of the young shoots. Rain and sun are excluded, and almost all light, for even from the roof of mats a row is hung down all round each field, the tops of the plants being hidden from view. One of the choicest kinds is the Gyokuro (Jewelled Dew), varying in price from 5 to $7\frac{1}{2}$ dols., equal to 14s 3d and 21s 3d per lb. The Uji plantations are said to date from the end of the twelfth century, though it is believed tea was introduced to Japan from China by a Buddhist Abbot—Dengyo Daishi—as far back as the year 805.

THE ROYAL BOTANIC GARDEN, CALCUTTA,—We give elsewhere Dr. King's report on this garden for the year 1895-96, which, though not lengthy, is interesting. From it we learn that the season from October to March was abnormally dry, and many plants and trees perished or were damaged by the drought. Steady progress has, however been made in improving the Botanic Garden, not only as a scientific centre for botanical students, but also as a pleasure resort for the public. The steps leading to Col. Kyd's monument were renovated and paved with marble; and a cutting from the sacred *Bo* tree at Buddha Gaya was presented by Mr. Grierson, late Magistrate of Howrah, and planted in the Garden. Attention was as usual given to the cultivation and distribution of plants of economic value. Among these the *sida*, a fibre-producing plant, and the *Adhatoda vasica*, a decoction of which is popularly believed to be a powerful insecticide in tea plantations, were cultivated at the instance of the Reporter on Economic Products. The decoction of *Adhatoda vasica* was submitted to a test, but the results are reported to have been of a somewhat doubtful nature. In Ceylon, says Dr. Trimen in his *Handbook of the Flora of Ceylon*, this plant is much cultivated by the natives as a fence, and is largely grown about Jaffna as a green manure for tobacco gardens. The Sinhalese names are *agaladora, wanepola*; and the Tamil *adátódai, pavettai*. A portion of the Sibpur Experimental Farm was devoted to raising wheat from samples of seed supplied from the various wheat-growing districts in Bengal, and Dr. Prain, the Curator of the Herbarium, is now preparing a report on the races grown and on their relations to the names they bear in different districts. The collection in the Herbarium was increased by more than 17,000 specimens, the chief contributors being the Director of the Royal Garden, Kew, and the Keeper of the Botanical Department of the National History Museum, London. During a portion of the year Dr. Prain was deputed to the wheat-growing districts of Upper India with the object of enquiring into the "host" or vehicle by which the blight affecting wheat and barley, commonly known as "rust," is propagated from year to year. The matter is one of the utmost importance, and it is hoped that Dr. Prain's investigations may render it possible to take effective measures for the prevention of these destructive blights. During the year two volumes were added to the interesting series of Garden Annals, containing monographs by Sir Joseph D. Hooker on Indian Orchids and by Dr. D. D. Cunningham on the obscure phenomena known as sleep and sensitivity in plant, most of which he traces to purely physical processes. Both Dr. King and Dr. Prain also contributed valuable papers on botanical subjects to various scientific journals. The Lloyd Botanic Garden at Darjeeling was in charge of Mr. Kennedy, who carried out various improvements in the roads and conservatories of the Garden. A gigantic specimen of the beautiful Australian fern, *Todea barbara*, weighing upwards of half a ton, was presented to the Garden by the distinguished botanist, Baron Von Mueller, K.C.M.G., F.R.S.

Correspondence.

To the Editor.

SILK IN CEYLON.

Kandy, July 23.

DEAR SIR,—As promised in my letter of 19th May, I now send you further particulars regarding other species of silkworms lately introduced.

The first which occupied my attention, after the castor-oil worms, was *Antheræa Assama*, the 'Muga' of Assam. This worm is only partly domesticated, the worms being reared, by the Assamese in the open air, in the same way as the Tusser in many parts of India. From the cocoons sent me a few moths emerged on the way, and laid their eggs in the box. The worms hatched six days later, but though I offered them leaves of fifteen different kinds, of such trees as seemed likely to suit them, they ate scarcely any and I was obliged to throw them away. We do not seem to have in Ceylon any of the trees on which this worm feeds in Assam, though there are many closely-allied species. The Muga worm gives five broods in a year, and if it can be domesticated will prove a very valuable acquisition. The demand for its silk in Europe is already very large, as it dyes more easily than Tusser and yields much finer fabrics.

The next species introduced was one of the many varieties of the *Bombyu mori*, the mulberry-feeding silkworm, from Bengal. This, like the castor-oil worm, is very prolific and gives eight broods in the year. The worms spin their cocoons about three weeks after hatching, and the moths emerge ten or twelve days later. I cannot say yet whether it is adapted to our higher elevations, but up to 2,000 feet it should do very well. Owing to our more equable temperature in Ceylon, the cocoons produced locally already show a very marked improvement on those reared in Bengal.

A third species, also a mulberry-feeding worm, and producing about eight broods in the year, seems more likely to be adapted to our higher districts, though often reared in the plains of India. My worms are being reared at an elevation of about 700 feet (temperature 75 deg. to 90 deg.), and the moths are very vigorous, but the worms may be found to produce larger cocoons in districts with a cooler climate.

As regards the disposal of the silk there is no difficulty. Until a silk Filature is established here the cocoons can be shipped to London or Calcutta. They should be dried, in the sun, if possible, a few days after spinning, to prevent the moths emerging, and packed in bales of 50 or 100 lb.

As I am anxious to resume experiments in domesticating the Ceylon Tusser worms, I shall be very much obliged to anyone who will send me a few live cocoons of this species. They may be found, at varying elevations, on the country almond, cashew, weralu, loquat, avocado pear, kahaata (patena oak) and other trees. The collection of wild cocoons in India, for weaving or export, has fallen off considerably, owing to the decrease of jungle through extended cultivation, and the demand is steadily increasing.

I am sending you specimens of different cocoons and a rough sketch of the Tusser cocoon, which I hope may be of use.—Yours faithfully,

B.

SILKWORMS AND RHEA OR RAMIE.

Colombo, July 28.

DEAR SIR,—Those who are experimenting in sericulture will find an interesting paper on the subject with a history of the little that has been done in silkworm rearing in Ceylon—by Dr. J. L. Vanderstraaten in the C. B. R. A. S's Journal, No. 23 of 1881. Some extracts from it, giving the experiences of Father Palla and Mr. Alex. Geddes should prove interesting to the readers of the *Observer* if reprinted.

I see from the last *T.A.* that some Ceylon planters have begun growing Rhea, and also that the operations of the Rhea Fibre Treatment Co., have been attended with a large measure of success.

I may mention that within the last year some 2,000 Rhea cuttings have been distributed by the Colombo "School of Agriculture."

By-the-bye, a good deal was at one time written about the value of Ramie leaves for feeding silk worms. Any one wishing to try the experiment can have parcels of leaves free of cost at the school.—Yours truly, C. D.

BAMBOO DOGCARTS.

Dindigul Club, 28th July 1896.

DEAR SIR,—Mr. W. Turing Mackenzie can obtain "Bamboo Carts" from Eduljee & Co. and Nowrojee & Co., both of Lucknow, Oudh, India.

Eduljee & Co. make them from *R160* upwards, and as they pack very well the freight upon them is little as compared to other carts.

The cheaper Bamboo Cart has no springs, the bamboo shaft acting as such, but much the better cart to have is the "Bamboo Muster" Cart, with C springs and horizontal springs. These are, of course, more expensive. I have one of the latter kind, specially built to hold one person, with lancewood shafts and springs, "Bamboo Muster"—but no bamboo about it, and it is a first-class cart and has stood no end of wear, it was built by Simpson & Co., Madras, and cost about *R450*.

For ordinary use the £160 cart of Eduljee & Co. is very good and serviceable.—Yours faithfully, G. MENGEL.

THE COST OF COCONUT CULTIVATION IN CEYLON.

Northern Province, August 1896.

SIR,—I have read with interest what literature I could get hold of during the last ten years or so on the subject of coconut cultivation in Ceylon; but I have never yet come across any article which gives you some idea as to what the upkeep of an estate of say 350 acres in the Northern Province would cost per year.

I think it will be interesting and instructive if some of your numerous correspondents will give the benefit of their experience for the guidance of those who wish to keep within reasonable limits in regard to expenditure.

I give the ordinary heads of expenditure below; but the list is by no means complete:—

1. Management.
2. Overseers.
3. Picking; assuming the annual crop to be say 400,000 nuts.
4. Copra making.
5. Dispatch of crop; including bagging, weighing, &c.
6. Collecting and carting nuts.
7. Stock-keepers.
8. Cattle food.
9. Horsekeep.
10. Fences.
11. Hoeing say 1-5th of the total area.
12. Ploughing say 1-5th of the total area.
13. Buildings.
14. Tanks, wells and roads.
15. Weeding.
16. Manuring.
17. General transport.
18. Nurseries.
19. Domestics.
20. Tools, &c.

Such a table of calculations drawn up in accordance with the present enhanced rates of payment will, I venture to think, prove eminently useful.—Yours faithfully, ROGATUS.

AN INSECT ENEMY OF TEA.

Woodslee Estate, Weuda, Aug. 12.

SIR,—I am sending you this day a parcel containing a few worms with some tea leaves, as they were found on the bushes. These I found attacking my tea bushes and destroying them to some extent.

Therefore would you be kind enough to observe these destructive insects and suggest a remedy against *this enemy of the tea bush*, through your valuable journal or otherwise.—Yours truly,

H. D. MARTIN.

[Our entomological authority writes:—"I have examined the tea leaves you sent me yesterday. The 'poochies' rolled up in the tip of some of them are caterpillars of a minute moth. In large numbers they would do harm to the tea bushes. The upcountry friend who sent them to you must know more about it than we can by a mere examination of the injured leaves."—ED. *C.O.*]

AN INSECT ENEMY OF TEA.

Woodslee Estate, Weuda, 22nd Aug. 1896.

DEAR SIR,—I am very thankful to you for the interest you have taken in examining the poochies I sent you the other day and giving insertion, in your paper, to the opinion of your entomological authority about the same. Sorry I am unable to make any better observation of the insects, as I cannot pretend to know the natural characteristics of these, in order to suggest a favourable remedy to destroy them altogether, before they can increase in large numbers, in which case "they would do harm to the tea bushes." But as far as I can observe the insects, they don't seem to be very rapid in their propagation. Therefore, I think, this enemy will not be able to destroy the tea bush to any appreciable extent. Still, I get them picked daily off my bushes and destroy them, this being the only way I could adopt in putting an end to this *insect enemy of tea*.—Yours truly,

H. D. MARTIN.

THE COCOA-BUTTER DUTY.—There seems (says the *Chemist and Druggist* of July 18th) to be a strange confusion about the cocoa-butter duty. On July 2nd the House of Commons resolved that a duty of 2d per lb. should be levied on it. On Thursday, July 9th, after a further debate, it passed a resolution declaring that "a duty of Customs of 1d shall be charged on that product of the cocoa-bean which is generally known as cocoa-butter," the Chancellor of the Exchequer declaring that Messrs. Fry & Sons and other dissenting firms had declared their acquiescence in that modified duty. The presumption was therefore that cocoa-butter imported between July 2nd and July 9th was dutiable at the rate of 2d per lb., and that imported after July 9th at the rate of 1d per lb. But upon making inquiry at the Custom House this (Thursday) afternoon, we were informed that no official order imposing a duty had yet reached that department, and that any cocoa-butter imported at this moment would still be admitted duty-free, unless indeed an order to the contrary should be received from headquarters before the lot was cleared. How to reconcile this statement with the House of Commons' resolutions we fail to understand. Is it possible that the official order giving effect to the resolution has become lost somewhere in the Circumlocution office?

DRUG REPORT.

(From the *Chemist and Druggist*.)

London, Aug. 6th.

CAMPHOR (CRUDE).—The London market is quiet. At the end of last week there were sellers of Formosa for August-October shipment at 95s per cwt., c. i. f. terms, but quotations vary a good deal. At auction today 149 packages of Formosa camphor, imported via Hamburg, sold at a decline of 7s 6d to 10s per cwt. compared with the last auction rates, but at about steady prices compared with the private quotations. The first 99 cases of the parcel realised 110s, and for the remainder 107s 6d per cwt. was accepted.

CAMPHOR (REFINED).—Unchanged. At auction today there were 22 packages of Japanese refined. For 1-lb. sablets a bid of 1s 4d per lb. was rejected, and ½ oz. squares 1s 7d would have been taken, but there were no buyers; ¼-oz. squares were bought in at 1s 8d per lb.

OILS (ESSENTIAL).—Clove oil, owing to a further decline in the raw material, has again been slightly lowered, the present quotation from the English manufacturers being from 1s 10d to 2s per lb., according to quality. On the other hand, there has been an advance in English Oil of cinnamon, which now stands at 7s to 7s 6d per oz. Citronella oil dull of sale, at 1s 4d to 1s 6d per lb. on the spot, according to packing. Lemongrass oil 2¾d spot, and 2 23-32d. per oz. c. i. f. Cinnamon-leaf oil is extremely scarce; bids of 4½d per oz. have been rejected this week. Patchouli oil extremely scarce. The English distillers ask 1s 10d per oz., and for Fisher's Singapore oil as much as 1s 8d is asked.

SEEDS (VARIOUS).—Thirty-five packages damaged dull Coriander seed from South America sold cheaply at 5s per cwt.; fair Malta cumin seed was bought in at 36s to 37s, and for fair bright East Indian annatto, a bid of 2½d per lb. was refused.

VANILLA.—Eighty-three packages were offered today and mostly sold. Good qualities, which are scarce, realised steady prices, 24s 6d to 26s per lb. for fine six inch, Mauritius, 15s 6d to 19s for mixed sizes. A large proportion of the supply, however, consisted of very badly-cured mouldy Seychelles vanilla imported via Bombay. The shipment of this has apparently been unduly hurried, and the result was that it has sold at the low price of 3s 6d to 7s 3d per lb.

VARIOUS DRUGS.—Cubebs are quite neglected. Seventy-four packages at auction were bought in; fair, partly stalky, from Singapore at 35s; ordinary, very small dusty and stalky mixed, at 25s per cwt. A case of two 45-lb. tins of very astringent Kino from Bombay was bought in at 12s per lb.

RHEA FIBRE.—*Capital* has the following remarks about rhea:—It is a stingless nettle that will grow in almost any soil that is not inundated. It is indigenous to Assam and can be traced away, we believe, right through Burma and the Shan States into China. That it has been long known in China is beyond a doubt; but the curing of it has not received much attention at John Chinaman's hands, although rude appliances have been in use for scraping the gum from the fibre for many years, and these crude implements can be seen at the British Consulate if any one is anxious to see them. In Assam the so-called Assamese silks are largely mixed with rhea. The great value of the filasse is that it retains its lustre and shines just as the silkworm silks does, until it has been several times subjected to the treatment of the Indian dhobie; wear out though it won't but simply loses its lustre, and those who have been in the habit of wearing Assam silk suits can distinguished the rhea filasse which has been mixed by the tiny knots into which it forms after several thrashings of the Hindu washerman.

CHAFED SKIN, PILES, SCALDS, BRUISES, CUTS, STINGS, NEURALGIC and RHEUMATIC PAINS, SORE EYES, EAR-ACHE, THROAT COLDS, and SKIN AILMENTS quickly relieved by use of CALVERT'S CARBOLIC OINTMENT.

Large Pots 13½d. each (English rate). Sold at Chemists, Stores, &c.

F. C. CALVERT & CO., Manchester.

TEA CULTURE IN ASSAM.

ANNUAL REPORT FOR 1895.

The following report has been issued by the Assam Administration :—

As in previous years, in the statement appended to this Report, figures are given for each sub-division separately in addition to the totals for each district. The statement has been modified in accordance with the instructions contained in circular letter No. 3070S., dated the 1st July 1895, from the Director-General of Statistics. Silchar continues to head the list in regard to the number of tea gardens and the area under tea cultivation, and the Dibrugarh sub-division still shows the largest outturn.

GARDENS OPENED AND CLOSED, EXTENSIONS, AND RELINQUISHMENTS.

The total number of gardens at the close of 1895 was 812 against 823 in 1894 showing a decrease of 11 gardens. Details are given in the following table:—

District.	Number of gardens newly opened.	Closed or removed.	Amalgamated with other gardens.	Abandoned.	Total.	Increase or decrease.
	Number of gardens.					
Cachar ..	1	5	3	—	8	— 7
Sylhet ..	6	—	—	—	—	.. 6
Kamrup ..	4	6	1	—	7	— 3
Darrang ..	2	4	1	—	5	— 3
Nowgong ..	—	1	—	—	1	— 1
Sibsagar ..	2	—	3	—	3	— 1
Lakhimpur...	—	1	1	—	2	— 2
Total ..	15	17	9	..	26	11

During the year 15 gardens were newly opened against 48 in the previous year; 17 were closed against 7 in 1894, and 9 gardens were amalgamated with other gardens, against 10 in 1894.

NUMBER AND AREA OF GARDENS AND AREA OF ALL LANDS HELD BY TEA PLANTERS.

The following statement compares the number of gardens in each district and the area of lands held for purposes of tea cultivation, and also the total area of all lands held by tea-planters for the past two years :—

Total area of tea grants, in acres. 1894.	1895.	Increase or decrease in acres.	Total area of all lands held by tea-planters in 1895, in acres.
283,097	283,194	+97	283,194
180,399	131,544	—48,855	200,107
100	100	—	100
852	852	—	852
19,518	18,798	—720	24,122
104,716	92,956	—11,760	105,294
50,144*	50,404‡	+260	53,592
228,851	230,350	—1,499	241,451
187,315	187,589	+274	187,589
1,051,992†	995,787‡	—59,205	1,096,301

* Includes one unworked garden.

† Revised figures.

‡ Includes 1,286 acres of land not fit for tea cultivation and not included in column 10 of the statement appended to the Report.

District.	Number of tea gardens. 1894.	1895.	Increase or decrease.
Cachar ..	206	199	— 7
Sylhet ..	127	133	— 6
Khasi and Jaintia Hills ..	1	1	..
Goalpara ..	3	3	..
Kamrup ..	32*	29*	— 3
Darrang ..	87	84	— 3
Nowgong ..	55†	54†	— 1
Sibsagar ..	175	174	— 1
Lakhimpur ..	143	141	— 2
Total ..	829	818	11

The large decrease in the area of tea grants is mainly due to the decrease of 48,855 acres in Sylhet. The Deputy Commissioner explains that the figures shewn in column 6 of the above statement were obtained from the managers of tea estates, and are not reliable. He estimates the area of tea grants in his district at 159,959 acres. The decrease in Kamprup is due to the closure of some gardens, while in Darrang it is attributed to greater accuracy in the figures now furnished. The total area of grants is the same as the total area of all lands held by planters in the districts of Cachar the Khasia and Jaintia Hills, Goalpara and Lakhimpur. The corresponding totals in respect of the other districts differ considerably. Steps were taken during the year to ensure greater accuracy in respect of the figures contained in this statement, and the matter is still under consideration.

RETURNS AND ESTIMATES.

Some improvement has taken place in the number of gardens furnishing statistics. Out of 812 gardens statistics have been furnished in respect of 717 gardens, against 698 in the preceding year; estimates had to be framed for 95 gardens, against 125 in 1894. The Chief Commissioner's thanks are due to those managers and agents who have furnished the required information.

NUMBER OF PERSONS EMPLOYED.

The table below shows the total number of persons employed permanently and temporarily on tea gardens in each district:

District.	Total number of persons employed during the year. Permanently. 1894.	1895.	Temporarily. 1894.	1895.
Cachar ..	61,183	66,229	10,616	6,320
Sylhet ..	72,369	85,094	34,550	10,951
Goalpara ..	275*	262	15*	34
Kamrup ..	1,151	2,915	2,671	372
Darrang ..	22,386	45,972	31,386	6,404
Nowgong ..	15,331	18,663	3,684	2,556
Sibsagar ..	65,117	77,343	11,447	7,597
Lakhimpur ..	90,602	96,864	3,554	5,044
Total ..	331,914	393,342	97,923	39,278

* Revised figures.

The total number employed permanently shows an increase of 61,428 persons. The decrease in the number of temporary hands is attributed to the new method of calculation adopted in accordance with the instructions contained in Circular No. 53—51, dated the 14th of November, 1894, from the Government of India in the Revenue and Agricultural Department. It has not been found possible to reconcile the figures with those in the Provincial Labour Immigration Report. It may, however, be remarked, as in paragraph 5 of last year's report, that of the two sets of figures those in the Immigration Report should be accepted as the more correct.

AREA UNDER MATURE AND IMMATURE PLANTS AND TOTAL AREA OF TEA GRANTS.

The following statement gives the areas under mature and immature plants and the total area held by tea-planters during the last fifteen years :—

* Including six unworked gardens in 1894 and five unworked gardens in 1895.

† Includes one unworked garden.

(1) Under mature plants. (2) Under immature plants. (3) Total area of tea grants.

Year.		(1) Acres.	(2) Acres.	(3) Acres.
1881..	..	133,293	25,131	706,649
1882..	..	156,707	22,144	783,362
1883..	..	161,707	27,746	922,664
1884..	..	158,158	31,694	913,476
1885..	..	159,876	37,634	921,891
1886..	..	170,138	33,855	934,134
1887..	..	177,900	33,179	950,171
1888..	..	188,329	28,347	955,499
1889..	..	196,689	30,560	1,000,665
1890..	..	200,658	30,380	994,497
1891..	..	208,407	33,416	996,746
1892..	..	213,525	33,667	1,041,984
1893..	..	221,368	35,257	1,042,277
1894..	..	229,316	39,480	1,054,992*
1895..	..	234,909	41,105	994,501

* Revised figures.

AREA UNDER TEA CULTIVATION IN EACH DISTRICT.

The following statement compares the total area under tea cultivation for the past two years, district by district:—

District.		Total area under mature and immature plants. 1894. Acres.	1895. Acres.	Increase or decrease. Acres.
Cachar..	..	59,586	58,216	— 1,370
Sylhet ..	..	54,926	62,979	plus 8,053
Khasi and Jaintia Hills..	..	30	30	..
Goalpara	..	380	400	plus 20
Kamrup	..	4,534	4,953	,, 419
Darrang	..	33,101	28,750	— 4,351
Nowgong	..	11,837	12,239	plus 402
Sibsagar	..	59,925	63,264	,, 3,339
Lakhimpur	..	44,477	45,183	,, 706
Total	..	268,796	276,014	,, 7,218

The total increase of 7,218 acres, as compared with 12,171 acres in 1894, is distributed among all districts, except Cachar and Darrang. In Cachar it is stated that new extensions have not kept pace with the areas of old tea abandoned, and in Darrang the decrease is said to be more apparent than real, being due to greater accuracy in the figures for certain gardens for which estimates had to be framed in previous years.

AREA TAKEN UP FOR PLANTING, BUT NOT YET PLANTED.

The following statement shows the total area of lands taken up for planting, but not yet planted:—

District		Acres.
Cachar	..	224,978
Sylhet	..	68,566
Khasi and Jaintia Hills	..	70
Goalpara	..	452
Kamrup	..	13,815
Darrang	..	64,206
Nowgong	..	36,876
Sibsagar	..	167,086
Lakhimpur	..	142,406
Total	..	718,487

THE TOTAL OUTTURN OF THE PROVINCE.

The total outturn of tea during the year was 99,524,574 lb., against 94,829,059 lb. in 1894, showing an increase of 4 695,515 lb. The table given in the next column compares the figures furnished by the Indian Tea Association and the figures of the Trade Returns with those reported by the Deputy Commissioners in their annual tea reports:—

OUTTURN BY DISTRICTS.

Source of Information.	1894. Brahamaputra Valley.	1894. Surma Valley.	1894. Total.	1895. Brahmaputra Valley.	1895. Surma Valley.	1895. Total.
	lb.	lb.	lb.	lb.	lb.	lb.
Outturn according to Indian Tea Association	54,969,838	39,283,145	94,252,983	57,104,187	41.267,420	98.371,607
,, ,, to Trade Return ..	48,788,763	35,873.691	84,662.454	51,016,731	34,484,462	85,501,193
,, ,, to Annual Tea Report ..	56,532,435	38,296,624	94,829,059	56,640,815	42,883,759	99 ,524,57

Total Yield. 1894.	Total Yield. 1895.	Increase or Decrease.	Percentage of Increase or Decrease.
lb.	lb.	lb.	lb.
18,348,061	20.169,133	plus 1,821,072	plus 9·93
19,944,563	22,710,626	plus 2,766,063	plus 13·87
4,000	4,000	..	..
130,191	143,222	plus 13,031	10·00
776,495	660,328	—116,167	—14·96
12,574,480	11,036,662	—1,537,808	—12·23
3,782,818	3,864.357	plus 81,539	plus 2·16
21,837,191	22,240,698	plus 403,507	plus 1·85
17,431,270	18,695,548	plus 1,264,278	plus 7·25
94,829,059	99,521.574	plus 4,695,515	plus 4·95

The statement below shows the outturn of tea in each district for the past two years:—

District.	Rate of outturn per acre. 1894. lb.	1895. lb.
Cachar	339	393
Sylhet	470	485
Khasi and Jaintia Hills ..	200	133
Goalpara	343	377
Kamrup	194	136
Darrang	487	455
Nowgong	352	350
Sibsagar	402	389
Lakimpur	465	480
Total ..	414	424

There was an increase of 4,695,515 lb., or 4·95 per cent., over the figures of the previous year. Increases occurred in Cachar, Sylhet, Goalpara, Nowgong, Sibsagar, and Lakhimpur. The districts of Kamrup and Darrang alone showed a decrease in outturn. The Deputy Commissioner of Kamrup reports that six gardens were closed during the year, and that there was no cultivation in five other gardens.

The Deputy Commissioner of Darrang attributes the decrease in his district to the unfavouraple weather which prevailed during the year, and also to mosquito blight and red spider, which did much damage to some gardens in both subdivisions of the district. Floods, too, during the rainy season did some damage on certain gardens in Darrang. The increase in outturn in Sylhet and Goalpara is not explaiued by the Deputy Commissioners. In Cachar, the increase was ascribed to the weather having been more favourable and blights less severe than in the preceding year. In Nowgong, the increase in the outturn is attributed partly to extension of cultivation and partly to favourable weather; in Sibsagar, an increase in the outturn was obtained because a large area under tea came into full bearing; and in Lakhimpur, though there was an increase in outturn, the planters consulted by the Deputy Commissioner were generally of opinion that the year was not a prosperous one; the season was unfavourable, and most gardens were unable to work up to their estimated outturn. In this connection, it must be remembered that variations in the system of plucking of tea cause considerable difference in outturn. Planters frequently change from fine to coarse plucking, and *vice versâ*, according to the prices ruling, or expected to rule, in the market for fine or coarse teas, and such changes are sometimes sufficient to cause considerable differences in outturn independently of the adverse or favourable character of the season.

YIELD PER ACRE.

The yield per acre for the Surma Valley, the Brahmaputra Valley, and for the whole province, according to the district returns, is shown below:—

	1894. lb.	1895. lb.
Surma Valley	396	437
Brahmaputra Valley	426	414
For the whole province	414	424

The yield per acre, as furnished by the Indian Tea Association, is given below:—

	1894. lb.	1895. lb.
Surma Valley	407	420
Brahmaputra Valley	414	418
For the whole province	411	419

TEA-SEED.

The following statistics relating to the import and export of tea-seed for the past two years, are reproduced from the Trade Returns:—

	Imports. 1894. Mds.	1895. Mds.	Exports. 1894. Mds.	1895. Mds.
Surma Valley	..		2,227	3,469
Brahmaputra Valley	..		2,483	9,858
For the whole province	..		4,910	13,327

Most of the district reports furnish no details under this head. The Deputy Commissiouer, Cachar, reports that 43 maunds of tea-seed were imported from the Lushai Hills and 877 from Manipur. The price ranged from R20 to R60 per maund.

COST OF PRODUCTION.

As in previous years, Deputy Commissioners failed to obtain any reliable information regarding the cost of production. The Indian Tea Association have also expressed regret at their inability to furnish any statistics.

PRICES.

The district reports are equally defective so far as the prices of teas are concerned. The statistics furnished by the Secretary to the Indian Tea Association for 1895 are shown below:—

	As.	P.	
Surma Valley teas	7	4	per pound.
Brahmaputra Valley teas ..	8	7	,, ,,

These figures are considerably lower than those for 1894, which were as follows:—

	As.	P.	
Surma Valley teas	8	8	per pound.
Brahmaputra Valley teas ..	10	5	,, ,,

It should be remembered, however, that prices ruled exceptionally high in 1884. The figures for 1892 and 1893 were—

	1892. As. P.	1893. As. P.
Surma Valley teas	8 1½	6 5
Brahmaputra Valley teas ..	9 9	8 0

DISTRIBUTION OF RAINFALL.

The rainfall at each district headquarters during the last six years is given, in inches, in the following statement:—

Station.	1890.	1891.	1892.	1893.	1894.	Average for the previous five years.	1895.
1	2	3	4	5	6	7	8
Silchar ..	121·19	108·07	157·62	145·83	176·74	141·89	117·56
Sylhet ..	181·23	182·60	198·37	191·35	177·65	186·24	134·05
Dhubri ..	108·90	74·27	122·92	91·11	92·10	95·86	115·81
Gauhati ..	59·21	46·57	69·95	49·36	74·31	59·88	63·09
Tezpur ..	63·45	57·12	67·63	68·88	87·99	69·01	56·62
Nowgong ..	78·31	56·13	76·63	66·50	70·40	69·59	62·70
Sibsagar ..	92·79	88·39	103.98	84·30	97·02	93·30	114·24
Dibrugarh ..	125·08	95·58	138·53	89·22	131·17	115·91	114·99

As regards the effect of climatic influences on the crop, the Deputy Commissioners report as follows:—

Cachar.—There was one hailstorm during the year. From the 5th of June until the end of the month,

DEAFNESS. An essay describing a really genuine Cure for Deafness, Ringing in Ears, &c., no matter how severe or long-standing, will be sent post free.—Artificial Ear-drums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN, LONDON.

the weather was rather too dry for tea, and red spider was prevalent. In July and August the weather was variable and at times too cool, and mosquito blight was prevalent.

Sylhet.—The weather was on the whole not favourable. It was too dry at the beginning and end of the season, and too wet in the middle—from June to September. There were also in places disastrous hailstorms, and the cyclone of October did some damage.

Kamrup.—The year was noticeable for the early close of the rains, and the consequent early stoppage of tea manufacture.

Darrang.—The year was remarkable for its very short rainfall, and this seriously affected the outturn of tea. This was notably the case, on some of the finest estates in the district.

Sibsagar.—The weather was on the whole unfavourable to the crop, the rainfall being generally short and badly distributed. The early part of the season was unusually dry, while cold dull weather in July injuriously affected the flushing of leaf and manufacture, and the season closed earlier than usual in November.

Lakhimpur.—The season opened favourably. There were heavy floods in the beginning of July. Temperature was low in August and caused a check throughout the district. The rains ceased in October, and this brought the season abruptly to a close. Prices were much lower than in 1894, and the year was an unhealthy one. A leading planter in this district reports that blister blight, followed by caterpillar and mosquito blight appeared early in the season; mosquito blight attacked the gardens much earlier than usual, and lasted in some cases until the close of the season. A new blight was discovered by Dr. Watt. This blight attacks the indigenous plant only, the mites attacking the edges of the leaves and working their way gradually through the veins to the centre, the colour of the leaves so attacked. being of a pale yellow; if not checked, it would spread over the whole bush, prevent its giving any leaf, and possibly kill the plant. Dr. Watt suggested a remedy in the infusion of Adhatoda vasica, which he found most useful in preventing and exterminating the blight.—*Englishman*, July 28.

INDIAN PATENTS.

No. 2136 P.—Applications in respect of the undermentioned inventions have been filed, during the week ending 1st August 1896, under the provisions of Act V. of 1888.

Improvements in or connected with machinery for rolling tea leaf.—No. 261 of 1896.—Nathan William Horatio Sharpe, engineer, of 26, Perth road, Stroudgreen, London, for improvements in or connected with and for chlorine machinery for rolling tea leaf.

Improvements in apparatus for packing tea or such like substances.—No. 262 of 2896.—Nathan William Horatio Sharpe, engineer, of 26, Perth road, Stroudgreen, London' for improvements in apparatus for packing tea or such like substances.

Improvements to tea equalising or cutting mills.—No. 266 of 1896.—Samuel Cleland Davidson, merchant, of Sirocco engineering works, Belfast, Ireland, for improvements in tea equalising or cutting mills.

Improvements in the process of, and machinery or apparatus for, decorticating, preparing, twisting, and winding, peat fibre or other fibrous material.—No. 75 of 1896—Gustave Adolphe Cannot, merchant, of No. 20, Bucklersbury, in the city of London, for improvements in the process of, and machinery or apparatus for decorticating, preparing, twisting, and winding, peat fibre or other fibrous material. (Specification filed 14th July 1896.)

The fees prescribed in Schedule 4 of Act V of 1888 have been paid for the continuance of exclusive privilege in respect of the undermentioned inventions for the periods shown against each:—

For a machine for decorticating or extracting the fibre from the leaves of the aloe plant and other fibre bearing plants.—No. 220 of 1891.—Haribai Khanduji, contractor, residing at No. 13, Bhandup street, Mandvi Bunder, Bombay, for a machine for decorticating or extracting the fibre from the leaves of the aloe plant and other fibre bearing plants. (From 21st April 1896 to 20th April 1897.)

Whereas the inventors of the undermentioned inventions have respectively failed to pay the fees prescribed it is notified that the exclusive privilege of making, selling, and using the said inventions in British India and of authorising others so to do has ceased:—

An improved punkah-pulling machine.—No. 129 of 1891.—Neil Douglas' invention for an improved punkah-pulling machine. (Specification filed 28th April 1892.)

Improved method for preserving India Rubber, gutta-percha and goods made therefrom.—No. 266 of 1891.—Herbert Samuel Elworthy's invention for a novel or improved method for preserving India rubber, vulcanized india rubber, gutta-percha and goods made therefrom. (Specification filed 30th April 1992.)—*Indian and Eastern Engineer*, Aug. 15.

INDIAN TEA SALES.

(From *William Moran & Co.'s Market Report*,)

CALCUTTA, August 18th, 1896.

TEA.—During the fortnight 40,750 packages have been offered and sold. For some of the better grades prices have been a little irregular but not quotably lower. Medium sorts have been steady at previous rates, while all common tea has been well competed for and shows some slight rise in value.

This week the sales will be large, aggregating probably 30,000 chests.

Total quantity of Tea passed through Calcutta from 1st April to 15th August.

	1896.	1895.	1894.
Great Britain ..	37,407,642	34,365,964	34,321,216
Foreign Europe ..	101,813	118,846	72,820
America ..	189,947	204,927	107,237
Asia ..	1,200,593	1,298,221	914,736
Australia ..	1,723,659	1,913,217	1,402,120
	40,623,654	37,901,175	36,818,129

(From *Watson, Sibthorp & Co.'s Tea Report*)

CALCUTTA, Aug. 25.

27,739 packages of tea changed hands in the sales held on the 20th inst. In sympathy with London the market was not so active as it has been lately, and prices, although very irregular, generally displayed a downward tendency. The demand for the Colonies, Bombay and other places was strong and kept the range of rates for suitable grades very steady.

The average price of the 27,739 packages sold is As. 8.0 about 8¾d. per lb. as compared with 15,513 packages sold on the 22nd August 1895 at As.7.11 or about 8½d per lb. and 18,994 packages sold on the 23rd August 1894 at As. 9.0 or about 9½d per lb.

The exports from 1st April to 22nd August from here to Great Britain are 41,143,365 lb. as compared with 40,073,207 lb. at the correspondent period last season and 38 473,925 ib. in 1894.

NOTE.—Last sale's average was As. 8·5 or nearly 9¼d.

TELEGRAMS.—Reuter telegraphed from London on the 17th inst.—"Type" 7 15-16d, on the 18th—"Type" 7 13-16d on the 20th,—Offered 35,000, sold 32,000 packages. Rather less request and prices irregular. Average 10d. "Type" 8d, and on the 21st—"Type" 8d.

EXCHANGE.—Document bills, 6 months' sight, 1s 2¼d.

FREIGHT.—Steamer—£1-3-9 per ton of 50 c. ft.

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce*).

Colombo, Aug. 31st, 1896.

EXCHANGE ON LONDON : CLOSING RATES, *Bank Selling Rates*:—On demand 1/2 3 32 to 1-16; 4 months' sight 1/2⅓ to 3-32; 6 months' sight 1/2⅓ to 5-32. *Bank Buying Rates*:—Credits 3 months' sight 1/2¼; 6 months' sight 1/2 9-32. Docts. 3 months' sight 1/2 9-32; 6 months' sight 1/2 5-16.

COFFEE.—Plantation Estate Parchment on the spot per bus., R16·00 to 17.00. Estate Crops in Parchment, delivery R85·00 to 87·50. Plantation Estate Coffee, f.o.b. on the spot per cwt, no quot. Liberian parchment on the spot per bushel R13·00. Garden and Chetty Coffee, f.o.b. per cwt. R73·00. Native Coffee f.o.b. per cwt.—No buotations.

TEA.—Average Prices ruling during the week: Broken Pekoe, per lb 55c. Pekoe per lb 40c. Pekoe Souchong, per lb 31c. Broken mixed and Dust, per lb 27c.—Averages of Wednesday's sale.

CINCHONA BARK.—Per unit of Sulphate of Quinine, per lb 01½c. to 03½c.

CARDAMOMS.—per lb R1·50 to 2·00.

COCONUT OIL.—Mill oil per cwt. No quotations. Dealers' oil per cwt. R13·87½ to 13·62½ Coconut oil in ordinary packages f.o.b. per ton. R315·00 to 310·000

COPRA.—Per candy of 560 lb R38·00 to 46·00

COCONUT CAKE: (Poonac) f.o.b. per ton, R55 to 65.

COCOA.—Unpicked and undried, per cwt. R30 to 37·00

COIR YARN.—Nos. 1 to 8 { Kogalla per cwt. R9 to 18. Colombo ,, R7 to 14.

CINNAMON.—Nos. 1 & 2 only f.o.b. 64½c.
Ordinary Assortment, per lb 60½c.

EBONY: per ton.—R75·00 to 195·00.

PLUMBAGO:—Large Lumps per ton, R150
Ordinary Lumps per ton, R130 to 290.
Chips per ton, R80 to 140. Dust per ton, R30 to 90 continued better demand for fine qualities.

RICE.—Soolye per bag, R8·25 to R9·25.
Pegu and Calcutta Calunda per bag R8·75 to R9.25.
Coast Calunda per bushel, R3·20 to R3·40.
Muttusamba per bushel, R3·25 to R3·40.
Kadappa and Kuruwe per bushel—No quotations.
Rangoon Raw 3 bushel bag R9·00.

FREIGHTS.

Cargo.	Per ton London per str. s. d.	*N.York per str. s. d.	Trieste per str. s. d.	Mar'lles per str. s. d.	*Hamb', Bremen &c. s. d.
Tea	10/	17/6	15/	25/	..
Coconut Oil	10/	...	15/	25/	..
Plumbago	7/6	...	15/	25/	..
Coconuts in bags	7/6	..	15/	25/	..
Other Cargo	7/6	..	15/	25/	..
Broken Stowage	5/	..	..	..	..
SAILERS.					
Coconut Oil	..	27/6	..	..	..
Plumbago	..	27/6	..	..	..

LOCAL MARKET.

By Mr A. M. Chittambalam, 7, Baillie St., Fort.

Colombo, Sept. 1st, 1896.

Garden Parchment :—	Scarce	per bushel
Chetty do :-	do	do
Native Coffee :—	71·00 to 72·00	per cwt
do f.o.b. :—	76·00 to 77·00	do
Liberian Parchment,	12·50 per bushel (nominal)	
do Coffee	63·00 to 64·00 per cwt	
CARDAMOMS.—	1·00 to 2·00 per lb (nominal)	
COCOA.—(nominal)	32·00 to 40·00 per cwt	do
RICE.—Market Steady:—		
Kazla	R6·75 to 7·25	per bag
Soolye	7·50 to 8·50	do
Callunda Scarce	8·25 to 8·50	
Coast Callunda	3·00 to 3·25	per bushel
Kuruve (Scarce)		
Muttusamba	3·25 to 3·50	do

CINNAMON.—Quoted Nos. 1 to 4, at 62c and Nos. 1 and 2 a 65 cents per lb (nominal)

CHIPS.—R75·00 to 80·00

* Direct. Autwerp 7/6; Hamburg 10/ Genoa 12/6

COCONUTS.—Ordinary	R38·00 to 42·00	per 1,000 (nominal)	
do Selected	43·00 to 45·00	do	do
COCONUT OIL.—	13·87 to 14·12	per cwt	do
COPRA.—Mark Steady:—			
Kalpitiya	R46·00 to 46·50	per candy	
Marawila	44·00 to 45·00	do	
Cart Copra	39·00 to 42·00	do	
POONAC.—Gingelly	70·00 to 80·00	per ton	
Chekku	70·00 to 75·00	do	
Mill (retail)	65·00 to 75·00	do	
EBONY.—quotations at	R100 to R185	(nominal)	
SATINWOOD.—cubic feet	2·00 to 2·25	do	
HALMILLA.— do	1·25 to 1·50	do	
KITUL FIBRE.—Quoted at	R28·00	per cwt (nominal)	
PALMYRA FIBRE.—Quoted nominally:—			
Jaffna Black.—Cleaned (Scarce)			
do Mixed	R18·50 to 19·00	per cwt.	
Indian do	R7·00 to 9·00	do	
Do Cleaned	10·00 to 14·00		
SAPAN WOOD.—Quoted	55·00 to 60·00	per ton	
KEROSINE OIL—American	7·50 to 7·55	per case	
do Russian	3·39 to 3·44	per tin	
KAPOK.—Cleaned f. o.b :—	R27·00 to 30·00		
do Uncleaned (new)	5·75 to 6·00	per cwt	
Croton Seed	13·00 to 17 00	do	
Nux. Vnomica	2·50 to 3·00	per cwt	

CEYLON EXPORTS AND DISTRIBUTION 1895-1896.

COUNTRIES.	Coffee cwt. Plan-tation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1896 B'nch & Trunk lb	Tea 1896 lb.	Tea 1895 lb.	Cocoa cwt.	C'moms lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil 1896 cwt.	Coconut Oil 1895 cwt.	P'bgo. 1896 cwt.
To United Kingdom	10336	27	10363	740098	64304[illegible]34	60117221	22430	81086	490780	171660	47462	77185	82508
,, Austria	487	..	487	..	29054	2473	97	..	5300	83100	15517	12281	..
,, Belgium	27	..	27	..	24308	8113	82	2000	63200	66188	1919	3204	10575
,, France	459	..	459	6478	44147	30897	373	3000	49800	3500	114	.	2005
,, Germany	563	6	569	..	60699	176738	886	32216	267301	111622	7188	10741	21249
,, Holland	..	..	..	..	3889	10781	..	..	..	..	400	..	501
,, Italy	6	..	6	4188	7257	4973	6	..	74700	54208	1207	401	264
,, Russia	124	..	124	..	220332	179289	..	..	..	..	26	..	21
,, Spain	—	..	..	..	38010	38775	..	..	159830	8120	208	..	..
,, Sweden	52	..	52	..	4925	750	..	..	299	112	402	..	195
,, Turkey	..	..	..	..	12275	7367	..	..	..	..	.	..	..
,, India	221	..	221	1379	672757	617378	2	99361	..	..	46850	3708	730
,, Australia	3959	564	4523	..	7449355	6246537	70	..	7108	11368	1830	1318	3585
,, America	319	..	319	108390	373329	[illegible]41501	436	2187	80000	..	28580	96445	103364
,, Africa	..	..	..	..	51611	77553	..	..	..	..	4	..	502
,, China	188	..	188	..	161456	185610	..	200	57400	..	3749	474	..
,, Singapore	4	..	4	..	48211	21492	370	209	..	..	26973	8405	..
,, Mauritius	75	28	103	..	91790	109703	..	..	..	..	..	..	..
,, Malta	..	..	..	..	103600	45595	..	..	..	..	..	..	..
Total export from 1st Jan. to Aug. 31st 1896	16820	625	17445	860533	73701539		24752	220259	1255718	509878	182429		225499
do 1895	49605	3597	53202	729038	68122746		22025	250845	1196170	472448	214162		190421
do 1894	20895	587	21482	2102627	60430305		15746	205090	1075001	350671	305468		213962
do 1893	41948	1775	43723	2867214	56650918		24561	244486	1015567	340478	220280		261649

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, August 12th, 1896.)

	QUALITY.	QUOTATIONS.
ALOES, Socotrine ...	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic	Common to good ...	11s a 76s
BEES' WAX,		
Zanzibar & Bombay { White .	Good to fine ...	£7 a £8
Yellow...	Fair ..	£6 a £7
Mauritius & Madagascar..	Dark to good palish .	£6 5s a £6 15s
CAMPHOR, China ...	Fair average quality ...	107s 6d a 110s
Japan ..	,, ,, , ..	122s 6d a 125s
CARDAMOMS, Malabar..	Clipped, bold, bright fine	1s 1d a 2s 8d
	Middling, stalky & lean	1s 5d a 1s 9d
Ceylon.—Mysore ...	Fair to fine plump ..	1s 8d a 3s 7d
	Seeds ...	2s 9d a 2s 10d
,, Tellicherry...	Good to fine ..	1s 8d a 2s
	Brownish ..	1s 3d a 1s 8d
,, Long ...	Shelly to good ...	1s 6d a 3s
,, Mangalore .	Med brown to good bold	2s 4d a 3s 6d
CASTOR OIL, Calcutta..	1sts and 2nds ...	2¾d a 3⅜d
Madras	1sts and 2nds ...	2¼d
CHILLIES, Zanzibar ..	Dull to fine bright ..	25s a 35s
CINCHONA BARK.—		
Ceylon ..	Ledgeriana Chips ...	1d a 3½d
	Crown, Renewed ..	2d a 4½d
	Org. Stem	1¼d a 3d
	Hybrid Root ...	2¼d a 2½d
	Chip ...	1¼d a 2d
CINNAMON, Ceylon 1sts	Ordinary to fine quill ..	10½d a 1s 1d
2nds	,, ,, ...	9¾d a 1s
3rds	,, ,, ...	9½d a 11½d
4ths and 5ths	Woody and hard	8½d a 9½d
Chips	Fair to good ..	3d a 3⅜d
CLOVES, Penang ...	Dull to fine bright bold	7d a 11d
Amboyna ..	Dull to fine ..	3d a 4d
Zanzibar and Pemba }	Good and fine bright	2 1-16d a 2½d
	Common dull to fair ..	1⅞d a 2⅛d
Stems ..	Fair ..	⅞d
COCULUS INDICUS ...	Fair ..	7s 6d a 8s
COFFEE ...		
Ceylon Plantation	Bold to fine bold colory	110s a 118s
	Midding to fine mid .	100s a 108s
	Low mid. and low grown	95s a 100s
	Smalls ...	87s a 95s
Native .	Good ordinary ...	70s a 78s
Liberian ...	Small to bold ...	70s a 80s
COCOA, Ceylon ..	Bold to fine bold ...	58s a 71s
	Medium and fair ...	50s a 56s
	Triage to ordinary ...	20s a 50s
COLOMBO ROOT... ...	Fair to good ..	12s a 17s
	Ord. & middling wormy	9s a 11s
COIR ROPE, Ceylon ..		nominal
Cochin ..	Ordinary to fair	£10 a £15
FIBRE, Brush ..	Ord. to fine long straight	£10 a £24
Cochin ...	Ordinary to good clean	£12 a £17
Stuffing	Common to fine	£5 a £6 10s
COIR YARN, Ceylon ..	Common to superior	£12 a £26 10s
Cochin ..	,, ,, very fine ..	£12 a £34
do.	Roping, fair to good	£11 10s a £15
CROTON SEEDS, sifted...	Fair to good ...	66s
CUTCH	Fair to fine dry ..	17s a 32s 6d
GINGER, Bengal, rough	Fair ...	11s
Calicut, Cut A	Good to fine bold ..	60s a 73s 6d
B & C	Small and medium	42s a 56s 6d
Cochin Rough...	Common to fine bold	32s 6d a 34s
	Small and D's ...	28s a 39s
Japan .	Unsplit ...	15s a 16s
GUM AMMONIACUM ..	Sm. blocky to fine clean	17s a 36s 6d
ANIMI, Zanzibar...	Picked fine pale in sorts	£10 7s 6d a £13
	Part yellow and mixed	£7 17/6 a £10 10s
	Bean and Pea size ditto	70s a £7 12/6
	Amber and dk. red bold	£4 5s a £9
	Med. & bold glassy sorts	90s a 137s 6d
Madagascar ...	Fair to good palish ..	£4 8s a £6 15s
	,, ,, red ..	£5 a £7 5s
ARABIC E. I. & Aden ...	Ordinary to good pale	50s a 70s
Ghatti ..	Pickings to fine pale ...	25s a 75s
Kurrachee	Good and fine pale ...	65s a 75s
	Reddish to pale selected	35s a 55s
Madras ...	Dark to fine pale ..	45s a 65s
ASSAFŒTIDA ...	Clean fr to gd. almonds	40s a 70s
	Ord. stony and blocky	15s a 35s
KINO ..	Fine bright ..	£20 a £25
MYRRH, picked ..	Fair to fine pale ...	80s a 90s
Aden sorts	Middling to good ..	35s a 65s
OLIBANUM drop ..	Good to fine white ...	55s a 60s
	Middling to fair ..	20s a 51s
pickings	Low to good pale ...	7s a 15s
siftings	Slightly foul to fine ...	9s 6d a 11s
INDIARUBBER, Assam	Good to fine ...	1s 10d a 2s 3½d
	Common to foul & mxd.	3d a 1s 6d
Rangoon	Fair to good clean ...	1s 4d a 1s 11½d
Borneo ...	Common to fine ..	1s a 1s 7d

	QUALITY.	QUOTATIONS
INDIARUBBER, *(Contd).*		
Java, Sing. & Penang	Foul to good clean ..	1s 3d a 2s 3d
Mozambique (	Good to fine Ball	2s 2d a 2s 5d
	Ordinary to fair Ball	1s 2d a 2s 1¾d
	Low sandy Ball	10d a 1s 1d
	Sausage, fair to good	1s 4d a 2s 5½d
	Liver and livery Ball	1s 3½d a 2s 2½d
Madagascar {	Fr to fine pinky & white	1s 11¼d a 2s 5d
	Fair to good black ..	1s 3d a 1s 10d
	Niggers, low to good ..	10½d a 1s 6½d
INDIGO, E.I. ..	Bengal--	
	Shipping mid to gd violet	4s 6d a 5s 2d
	Consuming mid. to gd.	3s 9d a 4s 4d
	Ordinary to mid. good	2s 10d a 3s 8d
	Mid. to good Kurpah ..	2s 6d a 3s 3d
	Low to ordinary .	1s a 1s 6d
	Mid. to good Madras .	1s 4d a 2s 10d
MACE Bombay, & Penang	Pale reddish to fine ..	1s 7d a 2s 2d
	Ordinary to fair ...	1s 2d a 1s 6d
	Chips and dark	1s
MYRABOLANES, Madras	Dark to fine pale UG ..	2s 6d a 4s 6d
	Fair Coast ..	4s
Bombay ..	Jubblepore ...	3s 9d a 6s
	Bhimlies ...	3s 9d a 7s
	Rhajpore &c. ...	3s 6d a 5s 6d
Bengal .	Calcutta ..	3s 6d a 5s 6d
NUTMEGS—	64's to 57's ..	2s 11d a 3s 2d
Bombay & Penang	110's to 80's ...	1s 2d a 2s 10d
	160's to 130's ...	9d a 1s
NUTS, ARECA ...	Ordinary to fair fresh	8s 6d a 12s 6d
NUX VOMICA, Bombay	Ordinary to middling ..	4s 6d a 6s
Madras	Fair to good bold fresh	6s a 7s 6d
	Small ordinary and fair	4s 6d a 7s
OIL OF ANISEED ...	Fair merchantable ...	7s 6d
CASSIA ..	According to analysis	4s 8d a 7s 6d
LEMONGRASS ..	Good flavour & colour ..	2¼d
NUTMEG ..	Dingy to white ...	3½d a 4d
CINNAMON ...	Ordinary to fair sweet ..	4d a 1s 3d
CITRONELLE ..	Bright & good flavour ..	1s 6d
ORCHELLA WEED—		
Ceylon ..	Mid. to fine not woody .	11s a 15s
Zanzibar. ..	Picked clean flat leaf .	10s a 20s
	,, wiry Mozambique	15s a 17s 6d
PEPPER (Black)—		
Alleppee & Tellicherry	Fair to bold heavy ..	2¼d a 2½d
Singapore .	Fair	2 5-16d
Acheen & W. C. Penang	Dull to fine ..	2d a 2⅜d
PLUMBAGO, lump ..	Fair to fine bright bold	15s a 17s 6d
	Middling to good small	3s 6d a 13s
chips .	Dull to fine bright	1s 6d a 8s 9d
dust ...	Ordinary to fine bright	2s a 6s
SAFFLOWER ...	Good to fine pinky ...	85s a 90s
	Middling to fair .	80s
	Inferior and pickings .	60s a 65s
SANDAL WOOD—		
Bombay. Logs	Fair to fine flavour .	£30 a £50
Chips	.. ..	5s a £3
Madras, Logs	Fair to good flavour ..	£30 a £50
Chips	Inferior to fine	£4 a £8
SAPAN WOOD, Bombay	Lean to good ...	£4 a £5
Madras	Good average ...	£4 a £5 nom.
Manila	Rough & rooty to good	£4 10s a £5 15s
Siam	bold smooth ..	£6 a £7
SEEDLAC ..	Ord. dusty to gd. soluble	70s a 95s
SENNA, Tinnevelly ..	Good to fine bold green	6d a 8d
	Fair middling medium	2¼d a 5½d
	Common dark and small	½d a 2d
SHELLS, M. o'PEARL—		
Bombay ..	Bold and A's	£4 10s a £4 12s 6d
	D's and B's	£4 5s a £4 15s
	Small	75s a 85s
Mussel ...	Small to bold ...	10s a 50s
TAMARINDS, Calcutta	Mid. to fine bl'k not stony	9s
Madras ...	Stony and inferior ..	6s a 7s
TORTOISESHELL—	Selected	54s
Zanzibar and Bombay	Small to bold dark ...	
	mottle part heavy ...	17s a 23s
TURMERIC, Bengal .	Fair . ..	7s 6d
Madras .	Finger fair to fine bold	8s a 9s 6d
Do.	Mixed midling. [bright	7s a 8s
Do.	Bulbs	6s 6d a 7s 6d
Cochin ..	Finger	7s a 7s 6d
	Bulbs	5s 6d a 7s 6d
VANILLOES—		
Mauritius and } 1sts	Gd. crysallized 4 a 9 in.	17s a 32s
Bourbon ... } 2nds	Foxy & reddish 4½ a 8 ,,	11s a 15s
3rds	Lean and inferior ..	7s a 10s
Seychelles ...	Inferior to fine crystallized 3½ a 9 in. }	8s a 31s
VERMILION ...	Fine, pure, bright ...	2s 8d a 2s 9d

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for September:—

Vol. VIII.] SEPTEMBER, 1896. [No. 3.

SEASON REPORTS FOR JULY.

WESTERN PROVINCE.—Yala paddy crops thriving well, and harvest prospects good; dry grains sown to a small extent, but good; rainfall deficient, but better towards end of month; fruits and vegetables scarce, except in Rayigam Korale.

CENTRAL PROVINCE.—Maha cultivation commenced in Kandy district, fair yala crop; in Matale yala cultivation very successful; in Nuwara Eliya ploughing and sowing going on; prospects of dry·grains, where cultivated, good; rainfall, generally sufficient; fair supply of fruits and vegetables in Nuwara Eliya. *Stock.*—Some foot and mouth disease.

NORTHERN PROVINCE.—Paddy crops, good average; tobacco harvest over in Jaffna, prices low; rainfall deficient.

SOUTHERN PROVINCE.- Paddy fair in Galle except in Hinidum Pattu; poor in Hambantota, except under Tissa; but good in Matara; dry grains, good or fair; fruit and vegetables, fair supply; some rain in Galle, very slight in Hambantota; a few cases foot and mouth disease in Wellaboda Pattu.

EASTERN PROVINCE.—Paddy prospects in Trincomalee good; tobacco stock sold for good prices and exhausted; rainfall very heavy in Batticaloa; fisheries good; health of stock satisfactory.

NORTH-WESTERN PROVINCE.—Paddy crops and prospects good in Kurunegala, but want of rain has interfered with cultivation in Puttalam; good crops expected in the central Chilaw division, but the want of rain is felt in the southern division, and many fields have consequently been abandoned; foot and mouth disease in some parts, murrain decreasing in Katugampola but prevailing in Dambadeni Hatpattu.

NORTH-CENTRAL PROVINCE.—Weather dry; yala crop being reaped in Tamankaduwa, in other parts in various stages: murrain among cattle decreasing, foot and mouth disease broken out.

PROVINCE OF UVA.—Maha harvest good or middling; weather dry; vegetables scarce, and fruit scarce except in Wellassa: foot and mouth disease in some districts.

PROVINCE OF SABAGAMUWA.—Prospects of yala paddy crop good, preparation for maha crop commenced; weather favourable for all crops; foot and mouth disease on the decrease.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF AUGUST, 1896.

1	Saturday ..	·21	19	Wednesday ..	·10
2	Sunday ..	·36	20	Thursday ..	·08
3	Monday ..	·68	21	Friday ..	Nil
4	Tuesday ..	·55	22	Saturday ..	Nil
5	Wednesday ..	Nil	23	Sunday ..	Nil
6	Thursday ..	·04	24	Monday ..	Nil
7	Friday ..	·03	25	Tuesday ..	·15
8	Saturday ..	·45	26	Wednesday ..	·24
9	Sunday ..	·05	27	Thursday ..	·81
10	Monday ..	·09	28	Friday ..	·78
11	Tuesday ..	Nil	29	Saturday ..	·07
12	Wednesday ..	Nil	30	Sunday ..	Nil
13	Thursday ..	Nil	31	Monday ..	Nil
14	Friday ..	Nil	1	Tuesday ..	Nil
15	Saturday ..	Nil			
16	Sunday ..	Nil		Total..	4·48
17	Monday ..	Nil		Mean..	·14
18	Tuesday ..	Nil			

Greatest amount of rainfall in any 24 hours on the 27th, Thursday, ·81 inches.

Recorded by M. W. K. BANDARA.

THINNING OF FRUIT.

The thinning of fruit is an important operation, particularly where the individual fruits in a bunch are, as often happens, much crowded together. One of the chief results of pruning is that the sap which is dissipated over a large number of branches is reserved for the developement of a few chosen ones, with the result that the latter are rendered more robust and fruitful. A similar result follows the operation of thinning fruit, for by the removal of surplus fruit, what is left is allowed to develope more perfectly. Again, where there is overcrowding in bunches, light and air are not equally supplied to the individual fruits, some of which become totally shut out from the influence of these necessary agents, which control proper developement and maturing.

Some object to thinning in vine cultivation on the score that a bunch of grapes is itself a fruit, and therefore will not suffer being interfered with. This is a fallacy, which those who are unacquainted with structural botany are apt to accept as fact. A bunch of grapes is no more a fruit than a bunch of plantains or a bunch of coconuts. A fruit is the product of a single flower, and the fruits of the grape vine are true berries. There are such things as collective fruits which result not from a single flower but from a number of flowers. Instances of these are the fruit of the fig, jak, and pineapple. Botanists are careful to warn us against the fallacy above alluded to. For instance, in the text-book of structural and physiological Botany by Thomé and Bennet, special reference is made to the fruits of the grape vine as follows:—"The product of an inflorescence such as a bunch of grapes is not a fruit but rather a group of fruits, each separate berry or grape being a distinct fruit." Those of our readers who have seen the marvellously perfect grapes to be met with in fruiterers' shops in London, and are aware of the high prices they realize will not readily condemn the process of thinning which, as a rule, the English gardener adopts. A gentleman who has had great experience in growing table fruit writes to us:—"Thinning is a very necessary and important operation in grape-growing, if handsome bunches and good-looking and well-flavoured fruit are desired." In growing for wine, the necessity for thinning does not arise.

Mr. F. M. Bailey, F.L.S., the well-known Colonial botanist, in his "Half-Century of Notes for the Guidance of Amateur Botanists" has the following note on thinning of fruits:—"If we were not aware of the fact, a glance at the bulk of fruit brought into the city of Brisbane for sale would at once shew to the practical gardener or fruit-grower that little or no attention was being paid in Queensland to this most important operation. The exhaustion consequent upon the production of seed is a chief cause of the decay of plants. This explains why fruit trees are weakened or rendered temporarily unproductive, and some killed, by being allowed to ripen too large a crop of fruit, or to 'over-bear' themselves, as it is termed. It is to be sincerely hoped that amateurs, who one may hear often boasting of the breaking down of these trees from the weight of fruit, will bear this in mind. All who understand anything of the subject of fruit-growing consider that thinning is one of the most important of operations. It should be done with a bold and fearless hand, and the perfection of that which is left on the trees will amply reward the owner at the harvest time; and his reward will not only be in the superior fruit, for the trees being kept unweakened from over-bearing will be enabled to mature their wood, and deposit their store of sap to aid in the production of the following year's crop. Allow the air and light to get round each fruit, and less harbours will be found for the lodgement of insect life."

[Since the above was written we have been favoured with a communication (which we also publish in the present issue) from Mr. W. Nock, Acting Director of the Royal Botanical Gardens, and a horticulturist of large experience, whose opinion on the subject of thinning grapes should dispel any doubts as to the efficacy of the process from the minds of local vine growers.—ED. *A.M.*]

OCCASIONAL NOTES.

The article on "Ceylon Bee Culture" gives a record of what has been hitherto done in the island in the way of bee-keeping, and should prove interesting to intending apiarists. So far attempts at improved bee-keeping cannot be said to have been attended with marked success, but that is no reason why the industry, which has been established elsewhere, should not with greater care and perseverance than has hitherto marked attempts at bee-keeping in Ceylon, prove both possible and remunerative with us. In our next issue we hope to refer to the experience of another Ceylon apiarist, and also touch on the subject of hives.

We have been favoured with a copy of the Annual Report of the Sericultural Experiments for 1895-1896, undertaken at the instance of the Department of Land Records and Agriculture, Bengal, and a number of other periodical reports by Mr. N. G. Mukerji, specialist in sericulture. We hope to deal with these papers in our next issue.

By arrangement with the Hull Oil Manufacturing Company, Limited, we shall shortly undertake a series of experiments with the highly-spoken of Homco Rape Meal Manure so well reported upon by Dr. Bernard Dyer. The manure (to which reference was made in our last issue) is well suited to take the place of castor cake, and we shall be glad to have the co-operation of coconut planters and others in giving the fertilizer a fair trial.

The Patent Sultan Water-lift which we referred to and described in our issue of February, 1895, appears to be rapidly gaining popularity. A communication from the Superintendent of the Government Gardens, Bangalore, speaks in high terms of the lift, which we should greatly desire to see given a trial in Ceylon.

In our last issue, Mr. E. T. Hoole refers to the desirability of introducing some improved form of Sowing Machine to the notice of the grain cultivators of Ceylon. Some time ago we communicated with Messrs. Lankaster & Co., the well-known implement makers, with reference to their broadcast hand seed-sower. The Manager of the firm, in replying to us, wrote:—"We have no doubt that this machine would suit the needs of the rice

growers of Ceylon." He informed us, further, that the machine, which costs one guinea in England, can be sent by parcel post for about 5 shillings.

That a beginning has been made of Entomological work in Ceylon is a matter to be thankful for. The co-operation of foreign entomologists is not wanting, and we ourselves have received letters from England with reference to entomological research in the island. Miss Eleanor Ormerod, writing to us a few years ago, strongly urged the necessity for noting down the habits of the most injurious insects in the island, and collecting these notes in a report with figures and correct scientific names as well as popular names; giving us the assurance "If I could, I would most gladly help you." Lately, came a request from Mr. G. F. Strawson for information as regards insect and fungoid pests, with the remark, "The request I make would probably prove of advantage to your growers, as I devote the whole of my time to these subjects, and I should like to have the fullest information as to what is going on in Ceylon.'

A fresh demand would appear to have arisen for ploughs, not for use in paddy land, but on coconut estates particularly. During a late tour in the Kurunegala district we saw a number of English ploughs which are drawn by elephants on one of the many estates belonging to the De Soysa family in that district. On application for ploughs being made to the School of Agriculture, some of the larger implements which were given a trial in the early days of the school and found too heavy for work on paddy land, were sold with the sanction of Government. A coconut planter in the Kurunegala district purchased four Swedish ploughs, and another in the Mirigama district took over three turn-wrest ploughs. Since then a planter in Nuwara Eliya has taken a couple of ploughs on loan for use in the cultivation of corn as food for sheep. We have had some light ploughs made locally, weighing about 24 lbs., and costing less than R15, which have worked and worn well at the school.

THE INSPECTION OF MEAT.—II.

BY G. W. STURGESS, M.R.C.V.S., &c., Government Veterinary Surgeon.

(*Continued.*)

HORSE FLESH

is rather coarser in texture than beef, dryer, and darker in colour. It has rather a sweet taste, and it possesses a peculiar sickly odour which becomes more pronounced in two or three days. Sometimes the bones are taken out in order to deceive people and make it resemble beef, the term "Boned Horseflesh" being then applied. The fat is a very good guide being of a deeper yellow colour and softer in consistence than the fat of the ox.

It is not unfit for food when fresh and the animal healthy previous to death. On the Continent it is largely consumed as food, and to a great extent in some of the large towns in England. It is allowed to be sold, but the person selling must put up a notice to that effect over his shop printed in letters not less than four inches long. It is illegal to sell it for any other flesh.

Regarding the age of the animal a note may not be out of place. If the carcase is whole (with the head on) of course indication of the age is afforded by the teeth, otherwise only an approximate estimate can be formed from the appearance of the bones. In rather young animals the bones are comparatively larger, the ends more expanded, and they are softer and more easily cut than in older animals. Also, they are slightly darker red in colour, especially at the ends. In the case of poultry the leg bones break more easily in young than in old, and the beak is not so hard and tough as in older birds.

Marketable and Unmarketable Flesh.

Flesh may be said to be unmarketable when it presents any abnormal appearance, although it may not be unfit for food. It may be used privately. For instance, a comparatively thin carcase might be consumed privately, but should not be exposed for sale to the public. In one part of the country flesh is eaten that would be refused in another. Any flesh that is likely to produce harmful results in human beings should be condemned, also the flesh of any animal that has suffered from any disease transmissible to man.

Flesh that should be Condemned.

The flesh of an animal that has suffered from inflammation of any important organ, especially where it has led to mortification, or from *Pyaemia, septicaemia,* (blood poisoning), *Erysipelas, uraemia,* (urine poisoning), *Anthrax, variola,* (cowpox or sheeppox), *Trichiniasis* (a disease caused by minute worms lodged in the muscular tissue, especially in the pig).

Flesh of animals that have suffered from *Glanders or Farcy,* and from *Hydatid disease* (resulting from tapeworms where little bladders containing a clear or straw-coloured fluid are found in the internal organs and tissues); *advanced stages of swine fever, cancerous diseases, tuberculosis* (or consumption); *flesh shewing advanced stages of muscular disease, or that has undergone putrefaction;* or *flesh that gives evidence of dropsy.*

The administration of certain medicines to animals imparts an odour to the flesh and renders it unfit for sale; for example, such medicines as ether and turpentine give their characteristic odour to the flesh of an animal that died or is killed soon after a few doses.

In the examination of meat the internal organs must, if possible, always be obtained and their condition compared with that of the flesh.

There are various other organs and glands, whose examination is of the greatest importance, such for instance as the Lymphatic glands and the Haemolymph glands in certain animals. These can only be found and examined by an expert, and their enlarged, softened, discoloured or dropsical appearance determined by those conversant with the healthy or normal appearance.

The flesh should be carefully examined for dropsy, any undue moistness exciting suspicion.

Lining the inside of the cavity of the chest and the abdominal cavity a thin glistening membrane will be found. It is nearly transparent when healthy and slightly moist when the animal is freshly killed. In cases of pleurisy or tuberculosis this membrane is generally diseased.

In pleurisy it becomes thickened, opaque-red in colour, or it may be covered with coagulated

lymph. In tuberculosis it is also thickened and presents a warty appearance, little growths being found all over it, sometimes in bunches.

This membrane should be looked for because a dodge called "stripping" is practised, that is, carefully peeling it off to hide indications of disease. Stripping must always be regarded with suspicion, it is either performed to hide the diseases just mentioned or to remove the green stain caused by food which has escaped from the stomach or intestines. Again, it is resorted to, to remove the green colour arising from putrefaction.

The proper "setting" of the carcase is interfered with in disease, and in warm damp weather, or when the animal has been exerted or exhausted before death.

Abnormal Appearances of Flesh.

WHITE FLESH.

Very white flesh may be an evidence of bad nutrition, dropsy, anaemia or of general fatty disease. It may generally be taken as an indication of interference with the proper oxidation of the blood, probably some chronic lung disease. A localised white appearance may be the result of a muscular strain, and does not render the remainder of the flesh unfit for food.

Pallor of the flesh is also seen in animals that have died from choking, or from being over-driven prior to slaughter.

(*To be continued.*)

"NITRAGIN," OR THE USE OF PURE CULTIVATION OF BACTERIA FOR LEGUMINOUS CROPS.

The last number of the "Journal of the Royal Agricultural Society of England" contains an interesting contribution by Dr. Voelcker on the above subject.

How cultivated leguminous crops obtained their supplies of nitrogenous plant food and enriched the soil in these constituents for the succeeding crop, while themselves apparently independent of nitrogenous manuring, was, until the recent discovery of Hellriegel, a question that baffled scientific investigators. While the earlier experiments of Boussingault, confirmed as they were by those of Lawes, Gilbert, and Pugh in 1857, led to the conclusion that plants could not assimilate the *free* nitrogen of the atmosphere, it remained a fact well-known to practical men that a crop such as clover, under favourable conditions, grew well without nitrogenous manuring whatever, and that nothing proved such a good preparatory crop and manuring for a cereal such as wheat—an essentially nitrogen-requiring crop—as did a leguminous crop. As long ago as 1868 the late Dr. Voelcker showed as the result of direct experiments that during the growth of clover nitrogenous organic matter was stored up in the soil; that this increase took place where root fibres were most abundant; and that the nitrogenous matter gradually decayed and formed nitrates, in which state they were ready to be taken up by the succeeding cereal crop. He further indicated his belief that in some as yet unexplained way the atmosphere contributed directly to the accumulation of nitrogen in the soil in the case of these nitrogen-supplying crops. In 1886, however, Hellriegel, with his fellow-worker Wilfarth, supplied the true explanation, viz., that certain leguminous crops are able, by means of "nodules" which form on their roots, to fix the free nitrogen of the atmosphere. The precise nature of the nodules was further ascertained by Beyerinck, who found that the nodules of even the most widely different kinds of leguminous plants contained bacteria, which agreed so nearly with one another in their external properties, that he described them as belonging all to one species, to which he gave the name of *Bacillus radicola.*

Such a discovery as that of Hellriegel, naturally turned the thoughts of investigators to the consideration of the bearing it would have upon the practice of agriculture, and how it might be utilised. The name of Dr. Nobbe, the distinguished scientist, has been chiefly associated with this development, particularly after Helliregel's death. If the conditions had been discovered under which leguminous crops could assimilate the free nitrogen of the atmosphere, was it not possible to ensure that these conditions should be always present, and that the atmosphere should be, as it were, laid under contribution to supply *gratis*, for the benefit of crops that nitrogen which it contains in such abundance, but which is practically sealed to all crops, save those leguminous ones which possess the power of fixing it? This was the question which Nobbe set himself to solve, with the result that as recently as February 19th of the present year, at a meeting of the German Agricultural Society held in Berlin, Dr. Theil was able to make the interesting communication that Nobbe's work had culminated in the production, *on a commercial scale*, of bacteria for agricultual purposes. It was further announced that arrangements had been entered into with one of the largest firms of chemical manufacturers in Germany whereby the preparation of special inoculating materials for particular leguminous crops was to be carried on at these works, and that in a short time the works would be able, as a matter of business, to supply the preparations to anyone who might apply. To the leguminous inoculating material the name "Nitragin" was given and the designation duly registered. The word should therefore not be confounded with the English word "Nitrogen," since "Nitragin" applies generally to all the inoculating materials employed for special leguminous croqs.

When the news of this discovery reached England, the Royal Agricultural Society felt much interested in it, and directed Dr. J. A. Voelcker to investigate the matter on the spot, and to obtain what information he could about it. Accordingly, about the middle of April, he went to Höchst, and also subsequently visited Dr. Nobbe and others who had been at work on the subject. At the Höchst Fabrik he was given every facility for obtaining the required information, and there saw the actual preparation of the "Nitragin," and its production on a commercial scale, and in a form in which it could be put on the market and be utilised directly by agriculturists. The material had for only a week or two previously been thus prepared, but it was then obtainable for general use, and at one or two places had already been tried on ordinary agricultural soils and on a practical farming scale.

In our next issue we shall give further details with reference to the nature and preparation of "Nitragin."

PRUNING.

(*Continued.*)

When a branch is very weakly in appearance and there seems little hope of improving its condition, or if it is badly attacked by some fungoid disease, it is advisable to remove it at once instead of allowing it to die on the tree. By such interference the neighbouring branches will be benefitted, for the sap which had been appropriated by the weakly or diseased branch, and was practically wasted before will go to further nourish and help in the development of the remaining branches.

I have so far endeavoured to show how rational pruning will add greatly to the *vigour* of the tree which should have our first attention. This result obtained we are free to think about and operate for fruit. But we must first recognise the fact that an exuberance of sap in a branch tends to force its buds to produce wood. Hence it is that those branches where there is an affluence of sap produce more wood, while those which have a more moderate supply produce more fruit and less wood; therefore, when we notice a branch producing too much wood we must artifically obstruct the too free circulation of sap in its direction by, for instance, bending the branches towards the horizontal so as to force it into fruit by this means. On the other hand if wood is desired let the branch be brought to as vertical a position as possible, and the supply of sap confined to two or three buds only. The greater the obstacles to the free circulation of sap the greater will be the production of fruit in that branch or plant. Trees begin to form buds for fruit after a certain number of years. What the fruit grower has to do in order to check the free circulation or dissipation of sap and to induce production of fruit is to prune short at laterals and long on secondary branches. He should also arch or bend the vigourous branches as much as possible, occasionally expose the roots and fearlessly mutilate the thickest and most vertical roots which go deepest into the ground.

The more we force our trees into bearing the more we weaken them, while the more we treat them for wood, the more vigorous we make them. It is hence of the first importance to the fruit grower to know how to maintain the proper mean between fruit and wood, the health and durability of a tree depending upon the treatment directed towards this end. In doubtful cases it is better to give up pruning a branch for fruit than one for wood; for what we may lose this year will be gained in increased fruitfulness in the future.

Where buds that produce wood are more numerous than those which produce fruit, naturally a larger proportion of sap will go to the former, and the crop will suffer. This is why in plants of modetate vigour we find better specimens of fruit than in very vigorous or rank-growing trees.

Trees or their branch to which light, air and heat have not free access will be found to be weak. They will only grow in stature and prcduce neither new wood nor fruit. This is why it is advisable to give tree a symmetrical form, so that all the component parts of the tree may benefit by the action of light, air and heat, which are necessary agents for their health and strength.

All wood will not produce buds unless forced by the knife or by some interference with the new wood it carries. This is why orange and lemon trees, as grown here, bear good wood only from 14' to 20' from the ground, whereas if properly treated they could be made to do so at 6' with much advantage.

C. ZANETTI.

BEE-KEEPING IN CEYLON.

In his work entitled "Eight Years in Ceylon," Sir Samuel Baker refers at some length to Ceylon honey bees, of which he himself recognised four distinct varieties. He describes the Bambara as the largest and most extensive honey-maker, and refers to its comb as hanging from the bough of a tree like a Cheshire cheese, being about the same thickness but 5 or 6 inches greater in diameter. He goes on to say that the honey of this bee is not so much esteemed as that from the smaller varieties, as the flavour partakes too strongly of the particular flower which the bee has frequented, so that the honey varies in different seasons, and is sometimes so highly aperient that it must be used with much caution. So partial, he says, are these bees to particular blossoms that they migrate from place to place at different periods in quest of flowers that are then in bloom. The next honey-maker he recognises as very similar in size and appearance to the hive-bee of England. This variety, he remarks, forms its nest in hollow trees and in holes in rocks. Another bee he describes as similar in appearance but not more than half the size of the last-named, suspending a most delicate comb to the twigs of a tree. The nest he says is no larger than an orange, but the honey of the two latter is of the finest quality and quite equal in flavour to the famed "miel vert" of the Isle of Bourbon.

Referring to wax, Sir Samuel Baker states that in 1853 the export amounted to more than a ton, and he considers that a great deal more might be exported, but for the habit which the natives have of consuming the wax with the honey.

The honey bees of Ceylon are the Mi-messa (*Apis indica*), Bambara (*Apis dorsata*), Danduwel (*Apis florea*)—all belonging to the family *Apidæ*—and the kana-veyiya which belongs to the family *Trigonæ*.

The last-named does not demand much notice as it is practically of no value as a honey gatherer. Mr. Benton* describes them thus:—The worker of this bee is $\frac{3}{16}$ inch long, has a large head and a small blunt abdomen, the wings being longer than the latter. They are black with one light-coloured ring on the abdomen, which is also light-coloured underneath, stingless, very active, and gather pollen and honey. The strength of the worker is very great. The queen is dark yellow, and has an immense abdomen, her wings not being strong enough to lift her body into the air when the ovaries are filled with eggs. The worker cells of this bee are about half the size and of the shape of short, plump grains of wheat, and are placed in irregular bunches with passages between; the pollen cells or honey cells are fully

* An American apiarist who visited Ceylon.

as large as good sized peas, and each forms a group of its own. These bees are said to sometimes build a tube a foot long and ½ to ¾ inches in diameter, composed of particles of wood glued together with some resinous gum. Through this tube the bees enter. The kana-veyiya, according to Jayatilleke Mudaliyar, produces a small quantity of honey which it collects in the hollows of old trees and crevices of rocks or dilapidated buildings. The combs do not yield more than a tea-cupful of honey which has rather an acid taste and is only used for medicinal purposes. The combs are generally about 4 or 5 inches in circumference. They are said to be perfectly harmless and easily handled. This is no doubt the same bee referred to by Sir Samuel Baker as little smaller than a house-fly and building in the hollow of a tree "where the entrance to his mansion is a hole no larger than would be made by a lady's stiletto." The honey, Sir Samuel describes as "thick, black, and rather pungent but highly aromatic molasses."

Of the genus Apidae, the only species that is in any way cultivated, is the mi-messa, the common honey bee of Ceylon which is too well known to need minute description. The following is the method of bee-keeping in vogue among the natives as described by Mudaliyar Jayatilleke in the paper he read before the C.B.R.A.S. some years ago:—They sweeten the pot to be used as a hive by fumigating it with resin and place it in a cool elevated position, smearing the mouth of the pot with a little honey during the swarming season. The wild bees take to them without the least trouble and begin building their combs and filling them. When the proper season comes round the pots are broken and blown into to drive out the bees and all the honey as well as the brood combs abstracted. The honey is of course retained but he combs thrown away with the result that a great waste of material and reckless destruction of bee-life is caused. When the next swarming season comes round, which is between March and April, a fresh pot is set up in the manner described and in the same position for the next supply of honey which is obtained in July or August. The largest supply obtained by the natives in this way is said to be about 3 or 4 bottles. The wild bees build in the crevices and hollows of rocks and trees, and if the combs are not abstracted by hunters at the proper season, they themselves consume the produce and abandon the empty combs, betaking themselves to the woods. It is firmly believed by the natives that when the swarming season comes round the bees return to their old haunts and set to work again.

The Danduwel (*Apis florea*) is called by Mudaliyar Jayatilleke an unprofitable bee producing very little honey. It attaches its solitary combs, 9 in. by 5 in., to the branch of a tree. The honey from this bee is esteemed by the natives as being cool and nice, but the species is not considered to be at all adapted for rearing purposes, as its produce is very scanty.

Mr. Benton mentions that he did not see this bee, but that a piece of its broad comb which he secured was half an inch thick and showed hexagonal wax cells eighty-one to the square inch of worker comb, while the drone comb had twenty-five. The workers, he concluded, must then be about the size of *Apis indica*, but much more slender, being in fact quite wasp-like in shape, although the drones are on doubt quite as large, if not slightly larger, than those of *Apis indica*. This bee is said to build a single comb which it attaches to the branch of some tree or to the horizontal timber of a building. I think, says Mr. Benton, that under favourable circumstances it will, like other species of the same genus, build additional combs parallel to the first.

It was in 1881 that Mr. Benton visited Ceylon with the object of studying the characters of Ceylon honey bees and securing stocks of them. He declared that the Bambara (*Apis dorsata*) as "the most wonderful bee in the world," and recognised in it a splendid honey-maker. Through the help of Mudaliyar Samuel Jayatilleke of Kurunegala, Mr. Benton secured the stocks which he was in need of. He seemed to have satisfied himself that the Bambara is so much feared by the natives of Ceylon owing to its being confused with the Debara or large wasp, but that if intelligently managed in a manner which accords with its peculiar traits it will be found to be no more dangerous than the other species of the same genus.

The fate of the stocks of bees taken away by Mr. Benton from Ceylon is narrated in a letter written from Cyprus by the Apiarist to Mr. John Ferguson of the *Ceylon Observer*, where Mr. Benton states: "Upon my arrival in Beyrout the large bees, *Apis Dorsata* (Bambara) were still alive having withstood their long hot journey wonderfully well, showing great tenacity of life, so great as to surprise me. The box of little ones *Apis florea* (Danduwel-messo) were also in good order. I had fed both kinds with sugar during the journey. In Beyrout both were permitted to fly. The large bees seemed restless even when the air was cool towards night, and many came out and died, while the small ones were more prudent and only flew out when the air was warm. As a result the former dwindled away, while the latter were still in good order when arrived in Cyprus two weeks later. But an accident happened, soon after my arrival here, to the queen of my little bees, and now they are no more."

It is curious that Mr. Benton should have taken away with him a stock of *A. florea* (Danduwel), the least important of Ceylon bees, as he himself has stated, and not of *A. Indica* (Me-messa) the common honey bee of Ceylon, which is the only one at all cultivated. Indeed, the Editor of the *Ceylon Observer* referring to Mr. Benton's visit writes: (1) Mr. Benton. . . .returned to Colombo. . . . with some colonies of Bambara (*Apis dorsata*) as well as of the small *A. Indica*." And again (2) "We hope to hear of his (Mr. Benton's) safe arrival there (in Cyprus), and also of the safe arrival of his interesting charge, which will then probably be the first introduction of the *Apis Dorsata* and *A. Indica* into Europe;" while in a contribution written by Mr. Benton to an American Journal he himself states: "I did not see the bee which the natives call by this name (Danduwel-messo, the name heading the paragraph). On the occasion of Mr. Benton's visit to Ceylon he introduced some Cyprian bees into the Island. These bees are reported in the *Tropical Agriculturist* of June, 1881, to be flourishing well with Mr. W. H. Wright (at the Aviary, Colombo,) and Mudaliyar Jayatilleke (Kurunegala). Mr. Wright's experiments were not attended with success. He

is good enough to inform me in reply to a letter I wrote him, that he purchased hives from Mr. Benton at R50 each, and also kept several native hives, but regrets to say that he has not been successful in getting much honey. He fears the climate in Ceylon is not very favourable to apiculture. His experience is that the bees gather honey to be consumed by them during moon-lit nights, leaving only some of it for the use of their young during dark-night seasons, which is the only time the honey can be gathered, and what is secured is not very much. Mr. Wright still keeps a few hives on his Mirigama property, but gets no more from one pint to a quart at a time.

In 1882 some German bee-keepers addressed a letter to the Imperial German Consul at Madras applying for stocks of the Bambara bee to which their attention had been drawn by Mr. Benton, with the object (1) of domesticating it, and (2) of crossing it with the *Apis mellifera.* The possibility of this crossing was, however, scouted by Mr. Benton himself. There is no evidence forthcoming as to whether the required stocks were supplied.

A correspondent signing himself "Honeydew" details his experiences in his attempt to domesticate the Bambara in the *Tropical Agriculturist* of September, 1882. Though he had a hive made, as he describes it, "after the English pattern with sliding frames, glass top, &c." he did not meet with success, for while the bees fed heartily on the honey supplied to them during the dull weather, they all took wing on the first bright sunny day. "Honeydew's" way of securing a swarm is amusing enough. He advises that you should proceed at night with a servant and a pair of pyjamas:—"First, tie up the legs of the article of apparel, then gently put the top part over the bees close up against the rock, then with a stick cut away the bees as they hang and they all fall down in a mass, when by pulling the tape of the pyjamas the top is closed and there you have them." Having removed them they are let out of captivity into the hives by one of the legs.

In 1890 Mr. A. W. Jayawardene, late headmaster of the School of Agriculture and now a notary practising at Madampe in the Chilaw district, contributed some notes on Bee-culture to the *Agricultural Magazine.*

Not long after the publication of Mr. Jayawardene's notes, a letter was contributed to the *Ceylon Observer* of 18th June, 1890, by Mr. Joseph Holloway of Wattegama, who referring to the statement made by Mr. Jayawardene that the Bambara cannot be domesticated, gave his own experience as follows:—I had a swarm of Bambara in 1883 for months in a hive (latter made and sent out from Germany) kept in the verandah of my bungalow on Maria Estate. These got as tame as any bee ever will be, made their comb, deposited their honey in the upper, and had their brood in the lower part of the hive. Many visitors came and inspected them. The hive was always open, and the bees could easily have got away...... Unfortunately they swarmed during my absence from the estate, and the cooly-gardener was frightened to catch them again as I ordered him to do, and lost them.

Mr. Holloway mentions that Mr. R. Dathe of Estrup, Hanover, the largest bee-keeper in the world, came to Ceylon to secure a swarm of the Bambara in 1883. This apiarist stayed with Mr. Holloway, and after remaining some two months left with about seven hives full. Most of the bees died on the way to Jaffa, and the balance which were fed on sugar, honey and water after leaving the hives and returning to it on two occasions abandoned it entirely on the third. "Since then," says Mr. Holloway, "Mr. Dathe of Estrup and Mr. Zamalier of Jaffa have pressed me much to send them a swarm of Bambara which they say would be worth £50 in Germany. The difficulty is to get someone who understands how to feed them and keep the hive free from insects, and would not be afraid of a sting. It is on account of the latter that I had to give up bee-keeping, though I made a good start with Egyptian bees brought over by Mr. Dathe and our own bees."

THINNING GRAPES.

On a recent visit to the Agricultural School I was much struck with the fact that no attempt had been made to thin, either the bunches or the berries in the experimental plot of vines, and knowing from practical experience how the neglect of this work tells on young vines—or in fact on all young fruit trees—I have been led to make the following remarks which I trust may be of some use to those now experimenting with the cultivation of grapes.

In order to obtain healthy, well-developed and good-flavoured fruit for the table, it is absolutely necessary that the bunches and berries be early and carefully thinned. This operation requires patience, boldness, and a light steady hand.

The proper time to commence is as soon as possible after the flowers have set. The work when done at this time will save much wasteful expenditure of energy on the part of the vines, and will prove of great advantage in the making of large and handsome fruit.

The first thing to consider is whether the variety about to be thinned has long or short foot-stalks. If the latter, the thinning should be more liberally and evenly done. The berries of those varieties with the greatest length of foot-stalk should be left much closer together at the shoulders, as the berries will force each other upwards and outwards as they increase in size.

The tools required are a pair of grape scissors, a clean light stick and some good tying material. The inner bark of *Hibiscus tiliaceus,* the "Belipatta" of the Sinhalese is just the right thing for the purpose. This material was brought to my notice by Mr. Charles Byrde of Ambalangoda, and through his kindness in sending me a supply I have been able to experiment with it and have proved it to be excellent in every way and a first-rate substitute for the "Cuba Bast" so much used by horticulturists in Europe. It is a common wild plant in the low-country near the coast and the fibre is easily prepared.

To commence the actual work of thinning we should begin by tying up the shoulders, bringing each up to a horizontal position and, arranging them at equal distances all round. These will require 1, 2, 3, or more ties according

to their size and estimated ultimate weight. The ties should be about an inch apart so as to give full support and prevent the shoulders from being broken off (when the berries swell and gain weight) where the tying material is fastened. Should the bunches be large, the second tier of shoulders must be tied up in a line with the centres of the angles formed by those above, and so on until the bottom is nearly approached. This tying up which is only required in large bunches is the most tedious part of the work.

Commence thinning the berries from the base, gradually working up to the top, and cut away all the smaller and inner ones until the berries left are about an inch apart, which, in most cases, will be found to be about the right distance to allow for the full developement of the berries. Great care must be exercised in guiding the scissors, so that the points do not prick the fruit, and the central berry of each small cluster must be carefully preserved. At the lower part of the bunch this is generally the only one necessary to leave. The thin smooth stick may be used with the one hand to steady the bunch, while the other guides the scissors in cutting out the berries. It is better not to touch the berries at all with the hand.

If the vines are weak, or if the bunches have set too thick, the bunches will also require to be thinned. If the vine is healthy about 1 lb. of fruit may be left to each foot-run of rod.

In England, where grapes are grown largely for market, the thinning of the fruit often makes the difference between a paying and non-paying crop, especially in a wet season when an extra thinning is beneficial, as it causes the air to circulate among the berries and allows water to pass off without lodging and causing decay, as it would do if the berries were pressing hard on one another.

W. NOCK.

SERICULTURE.

Before giving a short account of some of the better wild silks in India, it would be well to mention that experiments have been carried on in Ceylon from time to time both in raising the wild silkworm as well as the domesticated varieties. But these experiments it would appear have not been followed with any appreciable success.

Dr. J. L. Vanderstraaten, in a paper contributed by him to the Journal of the Ceylon Branch of the Royal Asiatic Society in 1881, makes mention of some of these attempts. So far back as 1663 it appears from Valentyn's History of Ceylon, that "in Jaffnapatam experiments are made to nourish the silk-worm and obtain by it a source of livelihood. Mulberry trees have been planted here and in many other places, and they appear to thrive well. In January and February worms are transported from Jaffna, and other small insects can be collected here. These are occupations which are interesting and can be undertaken with little pains and at small cost."

Dr. Vanderstraaten also gives extracts from other works on Ceylon which have reference to Sericulture. In March, 1740, Governor Van Imhoff left the following memorandum on silk. "Silk has not been so successful as we anticipated when we began to grow it here." It is also mentioned that on the site of the village now known as Sedawatte, the first experiment in Sericulture was made by the Portuguese. The name Sedawatte means silk garden. Later on in 1879 Rev. Father Palla of the Roman Catholic Mission made attempts to raise the mulberry silkworm at Galle. In November, 1879, Father Palla applied to His Excellency the Governor, Sir J. R. Longden, to use his influence in obtaining a supply of eggs from China or Japan. In December, 1880, the first supply was received from Yeddo and handed to Father Palla. They began to hatch a few days after they were exposed to the air in a ventilated room. The caterpillars were kept in little paper boxes containing tender mulberry leaves.

The late Mr. Geddes, who was the Editor of the *Catholic Messenger*, carried on experiments in raising silk-worms at his garden at Parratte in Moratuwa. It appears from a letter which is published in the Royal Asiatic Society's Journal already referred to, that he succeeded in obtaining silk from cultivated as well as wild varieties, but it is doubtful whether the undertaking was a commercial success.

I have already noted in my previous paper that the three important varieties of wild Indian silks are the Tusser, the Muga, and the Eri worms.

The Tusser silk-worm is the most important of the Indian wild silks; it occurs in the forests of the lower plains. The Tusser goes through its metamorphosis twice a year. The worms hatch out from the eggs about the ninth day. They live and feed for from thirty to forty days passing through five moults at intervals of from five to eight days. After twenty-one days from the commencement of the spinning of the cocoons the moths come out. The cocoons are very compact containing a large amount of coarse buff-coloured silk. They are often of a very large size attaining nearly $2\frac{1}{2}$ inches in length and $1\frac{1}{4}$ inches in diameter. Dr. Watts, in his Dictionary of Economic Products of India, gives a list of the principal trees on which this worm feeds, and among others he mentions:—

Bassia latifolia ver. Mahawa, a tree closely allied to the Sinhalese *Mi.*
Bombax malabaricum, Sing. Katu Imbul.
Careya arborea, Sing. Kahata.
Celastrus paniculata, Sing. Duhudu
Chloroxylon swietenia, Sing. Buruta.
Eugenia jambolana, Sing. Maha-dan
Ficus religiosa, Bo.
Lagerstrœmia indica and L. parviflora, Sing. Muruta.
Ricinus communis, Sing. Endaru.
Shorea robusta, Sal.
Tectona grandis, Sing. Tékka.
Terminalia balerica, Sing. Bulu.
T. catappa, Sing. Kottamba.
Zizyphus jujuba, Sing. Masan.

Mr. Geddes in a letter regarding this experience of the Tusser silk-worm at Moratuwa, mentions that the worm also feeds on Kaju (*Anacardium occidentale*), Weralu (*Eleocarpus serratus*), &c. Another plant which he mentions as *Katakaluwa* must be the Sing. Bovitya (*Melastoma malabathricum*).

W. A. D. S.

(*To be continued.*)

FRUIT CULTURE IN WESTERN INDIA.

The fruit-grower finds a ready market for his produce in Bombay. The large number of steamers that call at the harbour as well as the wealthy European and native population of the city readily purchase the large quantities of fruit that are daily brought to the city and offered for rather high prices.

Bombay is famous for its mangoes; in fact they are *par excellence* the first of the indigenous fruit of Western India. The best varieties are the *Alfonzo* or *Appus* which is classed as No. 1, and the *Piry* which is No. 2. The latter fetches from R8 to R12 per 100, and the former R12 to R15; and so a gardener who possesses a few dozen trees of these varieties can make his fortune in a few years.

A typically good mango should be sweet, fibreless, thin-skinned, fairly large but small-stoned, and have as little as possible of the turpentine-like flavour in it. All these qualities are pretty well developed in the two varieties mentioned above, especially in the *Appus*.

It is by grafting that the excellence of these two varieties is preserved, as it is too commonly found that seed-grown trees do not prove true to their kind. The method of grafting adopted by the Bombay gardeners is that by "approach," seedlings which are a year old being used as stock. They are grown in pots and hung on the branches for the purpose. The grafting is done pretty much in the same way as that adopted in Jaffna.

One should be very careful in the selection of mangoes, for neither their colour nor their smell is a test of their good qualities. Indeed, I might say that the proof of the mango, as that of the pudding, is in the eating! Some inferior kinds give out a better aroma and have a more tempting colour than the superior varieties. Strangers are often misled in this way, and new arrivals from Europe, when they once happen to be so duped, contract a prejudice against mangoes in general.

Mangoes even of the best variety must be fully matured and perfectly ripe before they are eaten. Some of the best kinds are quite sour before properly ripe, and if gathered before they have matured and kept to ripen, they do not develope their best flavours and are often insipid.

The question as to the relative excellence of the Bombay and Ceylon mangoes is rather a difficult one to decide, and some of my Bombay friends would not tolerate the idea of the latter being considered superior in quality. It may, however, be safely said that a few of the Ceylon varieties, especially certain grafted ones of the North, compare very favourably with Bombay mangoes. The real "Japana" mango, so well-known in Colombo, although it is so modest-looking and unassuming in appearance, is not a variety to be despised. The only objectionable feature in it is that it has a little too much of the turpentinelike flavour, and I have seen some fastidious persons soaking the pulp in coconut "milk" or juíce before eating it, so as to get rid of this flavour.

A Ceylonese visiting Bombay will be surprised to find how much is made of the custard apple. Soon after the mango season is over in Bombay, custard apples begin to come in and take the place of the former fruit to a large extent. A custard apple tree is considered second only to the mango as regards profit. The price of a dozen custard apples ranges from twelve annas to a rupee. The tree bears better in Western India than in Ceylon, because more care is taken about it there, and it is attended to almost as much as the orange or any other fruit tree that is usually grown in orchards. Considering the fact that this tree can be easily grown and without any great expense, it will be to the interest of the Ceylon fruit-grower to take to its cultivation; and once the general public acquire a taste for custard apples, there will be a constant demand for them. The custard apple is a much more agreeable fruit than the other two allied fruits of the Nat. Order *Anonaceæ*, viz., the "sour-sop" and the "bullock's heart," the peculiar smell and sour taste of the former, and the rank, coarse flavour of the latter being objectionable to many. There is besides a common belief among the natives that the latter fruit when consumed largely brings on boils. None of these objections apply to the custard apple, and a stranger takes a liking to it very soon. But the fruit as we find it in Ceylon is small and requires much improvement which must be effected by careful selection and cultivation, and by introducing superior varieties from India or elsewhere if necessary.

Other fruits grown in and near Bombay in considerable quantities are the bananas, oranges, guavas, melons, the papaw, &c. The vine is grown at various altitudes, and the Black Hamburgh is reputed the best variety as regards flavour and regularity of bearing. English fruits such as apples and pears are brought chiefly from upcountry.

All these fruits find a ready sale in Bombay and here, in Ceylon, there is no reason why the case should be otherwise. With the large number of steamers that now call at Colombo, and with the increase of the wealthy European and native population in the metropolis, and the large towns in the Island, there is bound to be an ever-growing demand for fruit; and the supply must keep pace with it. Superior varieties of fruit if produced in abundance, especially in those parts from which the produce can be transported to the large town markets by rail, may be counted upon to yield good returns. By a system of careful selection, suitable cultivation, manuring, pruning and thinning out overcrowded fruits, many of the indigenous varieties of fruit can undoubtedly be improved and made to fetch higher prices in the market. Some trees that fruit earlier and later than the usual fruiting season should also be grown, if possible, so as to distribute the crops all through the year as far as practicable. Superior foreign varieties should be introduced in cases where the indigenous ones are poor; and grafting and budding should be resorted to as a means of improvement.

When we note the great strides made in America and Australia in fruit-culture, we cannot but admit that there are vast possibilities for a tropical and fertile Island like Ceylon for improving and developing the cultivation of fruits. And for some time to come, at least, there is no fear of the fruit-grower overstocking the home-market. But when we are threatened by such a crisis, then it will be time to think of sending out our fruit, preserved and tinned, to the foreign markets of the world.

E. T. HOOLE.

THE NUTRITIVE PROCESS IN PLANTS.

(Prof. J. Reynolds Green, D.Sc., f.r.s.)

Turning to more permanent stores than the cells of the leaf afford, how, for instance, is the structure which we know by the name of potato formed? When we cut it we find that, though bulky and solid, it is not woody but is of a succulent consistency, its firmness being largely due to distention of its substance by water. If we cut a thin section of it and look at it through the miscroscope we find it to be made up of nothing but cells, and that the greater number of them are gorged with grains of starch. These are much larger than the grains in the leaf and have a complicated structure, they are in shape irregularly oval, and their surfaces are marked by nearly concentric lines of striation, dividing them apparently into layers. The centre of these cells is not the geometrical centre of the grain, but lies near the smaller end, and the rings or layers are much narrower at that end than at the other. How did the starch get there? There is no chlorophyll in the part known technically as the tuber, nor has light access to it during its formation and growth.

The appearance of the starch there coincided in point of time with its removal from the leaves, which we have seen first formed it. To remove it a process of transformation was necessary, of just the opposite kind to that which led to its transitory appearance. The chloroplastid converted starch into sugar, something else must have again converted the sugar into starch. This was the first and essential step, for the solid grain of starch could not pass through the wall of the leaf cell and so travel from place to place in the plant. It has been ascertained in the last few years that this change is brought about in the leaf by the action of a so-called *enzyme*, or unorganized ferment, known as diastase, the same body as has been known for so many years to be the active agent in the saccharification of malt. The identification of enzyme in the leaf was difficult, but there is now no doubt of its presence. By its agency, particularly during the hours of darkness, when the constructive activity of the leaf was suspended, the transitory starch in the leaf-cells was converted into sugar. This sugar which is known as maltose, or malt sugar, made its way from the leaf down the stem into the tuber, which is really only an underground branch which becomes very much swollen and does not increase in length. It found a convenient path in those vascular bundles which supplied the leaf with water from the root, and which serve therefore as the channels of conduction not only for water but also for the elaborated products which the leaf has found. On reaching the cells of the tuber a conversion of the sugar into starch again took place. In these cells there are a number of small protoplasmic corpuscles, much like chlorophyll grains, only without the colouring matter. They are called *leucoplastids* because they are white or rather colourless. In their nature they resemble chloroplastids very closely, turning green when exposed for a considerable time to light. They not only resemble chloroplastids thus, but they behave very much like in relation to the stream of sugar solution which reaches them. Absorbing them, they form in the substance of their bodies starch, which they pour out from some portion of their surface. Thus a little profusion of starch appears at one side of a leucoplastid; soon another outpouring takes place which flows round the first one; a third follows, and a fourth, and so on, the successive layers causing the striated appearance we have seen to be characteristic of the adult grain. Their activity lasts much longer than that of the chloroplastid, and the starch grain is therefore much larger. Their activity continues, indeed, till they are completely used up and disappear. It is not very easy to see these leucoplastids in the potato; they can be aeen, however, more easily in other plants where they are larger and not round (*e.g.*, the cells of some orchids). In a few places, such as some pollen grains, starch grains are found in large numbers without the aid of leucoplastids so far as we know at present. They seem in this case to be coustructed by the protoplasm of the cell.

GENERAL ITEMS.

The following, with reference to ticks perhaps, the most troublesome pest of cattle in the tropics, is from *Nature*. In Ceylon, the favourite remedy against ticks is coconut oil with which infested animals are smeared, generally a mixture of common salt and oil being used for the purpose :—

"Dr. M. Francis, Veterinarian of the Experiment Station, has drawn our attention to an account by him of the method of destroying ticks on the cattle of Texas, and, as the study of the tick pest is one of his principal duties, this description is of great value. After several unsuccessful attempts to destroy the pest by various means, the dipping process has been adopted in Texas with very gratifying results. A large vat of five thousand gallons capacity is used, and the cattle are forced to swim through it. Various carbolic and arsenical sheep-dips were employed as solutions in the vat, but the results were not satisfactory; either the cattle had to be kept in the dips for too long a time in order to kill all the ticks, or they were irritated by the solutions. This led Dr. Francis to try the effect of oil in destroying the ticks. It is well-known that grease or oil, of almost any kind, is fatal to insects, lice, &c., and known facts as to the life-history and structure of ticks gave presumptive evidence that oil might be successfully substituted for the various commercial dips which had been employed. A layer from three-quarters to one inch in thickness, of crude cotton-seed oil on the water in the vat was first used, the cattle being forced to swim through the vat, so that when they emerged they were covered perfectly with oil. This had no apparent effect on the cattle, but was found to be exceedingly fatal to the tick, and was very much superior to any other treatment tried. Dips of different nature were experimented with, but none as yet used has given such satisfactory results as the cotton-seed oil. Kerosene emulsion was found to have no practical value; crude petroleum irritates the skin, and emulsifies with water; resin oil is useless for the purpose; corrosive sublimate is too dangerous and is not very fatal to ticks even in solution 1·250 in water, and tobacco sheep-dips have no practical value. Dr. Francis is at present studying the effects of other oils, the most promising being West Virginia Black, a mineral oil."

If wool-growers, horse-breeders and dairymen were to select their stock in the haphazard manner that many farmers select their seed grain, giving no subsequent attention towards selection and improvement, it goes without saying that several specialities for which our stock are becoming famous would deteriorate in quality with far greater rapidity than it has improved in the time spent in establishing the present standard of excellence. Careful natural selection and breeding are absolutely necessary in every branch of husbandry. By no one is the want of selection and improvement more severely felt than by the grain-grower. Every year the difficulty of obtaining good seed is increasing. Wheat-growers will bear this out. Varieties true to name are almost impossible to obtain. Good-looking seed is sometimes purchased under the impression that it is of the variety desired, but when the crop matures, the seed turns out to be a mixture of perhaps half-a-dozen different varieties. Perhaps not two of these varieties ripen at the same time. With a mixture of this kind an average ripening is impossible, and a decreased yield the inevitable result.

Why should the farmer depend upon the retailer for his supply of seed grain? Every farmer should make it a point to grow his own seed. If he has to purchase he should endeavour to personally inspect the crop while growing, so that he can satisfy himself not only as to its purity, but also as to its yielding capabilities. A change every third or fourth year will be quite often enough. It does not take long to grow a sufficient quantity of grain for seeding purposes for the whole farm. The main thing is to begin properly. By carefully selecting the best sample of grain it is possible to obtain seed possessing a producing power of fully 50 per cent. greater than under ordinary circumstances. Experiments in this direction have borne out the truth of this statement. "Like begets like," and when we are so careful in the matter of constitution and vigour in the animal kingdom why shou'd not similar watchfulness be displayed in the selection of seed grain?